

2 Introduction

2.1 The HealthConnect Project

The National Electronic Records Taskforce was established by the National Health Information Management Advisory Council (NHIMAC) to develop a co-ordinated approach to electronic health records in Australia. The Taskforce presented their report¹ in July 2000 that endorsed the creation of a national health information network – *HealthConnect*.

HealthConnect is the proposed national health information network to facilitate the safe collection, storage and exchange of consumer health information between authorised health care providers.

Under *HealthConnect*, health related information about a consumer can be messaged between providers and summary information — subject to the consumer’s consent — may be collected at the point of care and held for later reference and use. Points of care could include a hospital’s outpatient clinic, an emergency department, a general practitioner’s surgery or a community pharmacy. Health providers, again with the consumer’s consent, would be able to access this information for subsequent episodes of care, regardless of their location. Consumers would also have access to their own information either in hardcopy or electronically.

The information collected within *HealthConnect* would be in the form of standardised ‘event summaries’ developed as by-products of the clinical process. Event summaries could include information such as basic details about health treatments; a hospital discharge summary report, the results of pathology tests; or changes to the medicines prescribed. The event summaries would not necessarily contain all of the information and notes made by the provider in their clinical information system nor would they replace the point-to-point communication between providers.

In this way, up-to-date accurate and relevant consumer health information can be exchanged and shared between providers and be available where and when it is most needed — at the point of care.

Three Stage Development Process

The Taskforce proposed a three stage development process for the creation of *HealthConnect* that included:

- Research, design and development work (years 1-2)
- Construction and initial operation (years 3-5); and
- Subsequent growth and expansion (years 6+).

¹ A Health Information Network for Australia, July 2000

This approach was intended to allow for both the testing of the feasibility and utility of such a system as well as the preparatory work in establishing the building blocks for the longer term arrangements.

The period for the research and development work was initially proposed to run from July 2001 to June 2003 (designated Phase 1) but was subsequently extended to June 2005 (designated Phase 2).

Research & Development (Phase 1)

In Phase 1, the research and development work was driven by seven research questions of which four were identified as most appropriately addressed through action research trials known as the *HealthConnect* trials. The four action research questions were:

- Can *HealthConnect* prove its value?
- Is *HealthConnect* technically feasible?
- Is there a preferred implementation model?
- What will *HealthConnect* cost and is it sustainable?

States and Territories were requested to submit proposals to conduct trials and six trials were endorsed to proceed. These trials were:

- A Tasmanian trial based in Hobart;
- A Northern Territory trial based in the Katherine Region;
- Two Queensland trials – one based in and around Townsville and one based in South Brisbane;
- Two New South Wales trials – one based in the Western region of Sydney and one based in the Hunter Region.

The nature of the trials was to explore variants of the issues raised in the four action research questions and thus collectively contribute to the overall understanding and knowledge required for the implementation of *HealthConnect* as defined by the Phase 1 National Evaluation Framework².

In Phase 1 of *HealthConnect*, only the two fast-track trials (Tasmania and Northern Territory) became operational and evaluation reports were prepared.

Research & Development Phase 2

² Research and Evaluation Framework for *HealthConnect*, July 2002.

In Phase 2, the research and development effort was driven by eight business objectives. The main business objectives to which the *HealthConnect* action research trials contributed were:

- To demonstrate the value and feasibility of *HealthConnect* through further trialling and evaluation;
- To develop a robust business case for proceeding with national implementation;
- To finalise the *HealthConnect* technical design;
- To deliver selective *HealthConnect* system components.

The fast-track trials that were operational were continued and in the case of Tasmania expanded. During Phase 2, the North Queensland trial became operational (December 2003). At the time of this report, the Brisbane Southside trial and the two New South Wales trials are about to commence.

The Better Medication Management System (BMMS) / *MediConnect*

MediConnect (formerly called the Better Medication Management System or BMMS) was an Australian Government electronic health initiative developed to reduce the incidence of adverse drug events and resultant hospitalisations by improving access to more complete medicines information for consumers and health professionals. To achieve this, *MediConnect* was designed to be a secure national electronic medicines record system that would draw together, in a centralised database, consumers' medicines information held in computer systems of different doctors, pharmacies and hospitals. Information about a consumers' over the counter (OTC) medicines, complementary medicines and allergies could also be recorded providing a more complete medicines history.

Before proceeding to implement *MediConnect* widely it was decided that a field test should be conducted to see if the system had the right features for the key groups including consumers, doctors, pharmacists and hospitals, and that it worked well. As a result, the *MediConnect* Field Test was conducted in two locations, Launceston in Tasmania and Ballarat in Victoria.

The *MediConnect* Field Test and *HealthConnect* trials are now considered to be part of the overall *HealthConnect* program and it is appropriate to bring together the lessons learned across these projects into a single report.

2.2 The Lessons Learned

2.2.1 Assignment Brief

Trilogy Information Solutions (Intl) was engaged to produce a report that brings together the lessons learned from:

- The available *HealthConnect* Phase 1 and Phase 2 trial evaluation reports;
- The *MediConnect* Field Test evaluation reports; and
- The lessons learned documents from the Trial Managers' Forum.

The resulting report should:

- Identify the key lessons;
- Categorise and analyse these lessons to determine the implications for the implementation of *HealthConnect*;
- Present the lessons clearly in terms of their implications for the implementation of *HealthConnect*;
- Prioritise the lessons in terms of their importance to the project; and
- Identify any additional issues and gaps that may require development or testing in the implementation of *HealthConnect*.

2.2.2 Approach

The approach for the project is divided into 5 stages:

1. Research the available evaluation reports for the lessons learned and develop the classification framework;
2. Apply the classification framework to the lessons learned;
3. Develop the first draft report;
4. Undertake feedback consultation on the first draft report and prepare second draft report; and
5. Preparation of Final Report.

2.3 Materials Reviewed

The main documents reviewed in producing this Report and the reference numbers used in the Appendix for citing these references were:

- Evaluation of the Field Test of *MediConnect* Final Report (Draft), January 2005, (M1);

- *MediConnect* Field Test Evaluation – Launceston Phase 1, October 2003 (M2);
- Field Test Manager’s Report, Decision to move from Phase 1 to Phase 2, October 2003 (M3);
- *MediConnect* Field Test Evaluation – Ballarat Phase 1, December 2003 (M4);
- Evaluation of the Field Test of *MediConnect*: Second Evaluation Field Visits to Launceston and Ballarat, June 2004 (M5);
- Evaluation of the Field Test of *MediConnect*: Third Evaluation Field Visits to Launceston and Ballarat, November 2004 (M6);
- Evaluation of the Field Test of *MediConnect*: Fourth Evaluation Field Visits to Launceston and Ballarat, November 2004 (M7);
- Evaluation of the Field Test of *MediConnect*: Hospital Report, December 2004 (M8);
- *MediConnect* Field Test, Software Vendor Consultations, December 2004 (M9);
- Prescription Writing Software, Useability of *MediConnect* Functionality, December 2004 (M10);
- Useability Study of *MediConnect* Enabled Prescription Dispensing Software (PDS), December 2004 (M11);
- Evaluation of Phase 2 of the Northern Territory *HealthConnect* Trial Final Evaluation Report, February 2005, (NT1);
- *HealthConnect* Northern Territory Trial Interim Report, February 2003, (NT2);
- *HealthConnect* North Queensland Trial Interim Report & Early Lessons, July 2004, (Q1);
- *HealthConnect* North Queensland Trial Qualitative Feedback, November 2004 (Q2);
- *HealthConnect* North Queensland Trial, Independent Evaluation of Consumer and Provider Perspectives, Interim Report, June 2004 (Q3);
- Outcomes of the Trial Managers’ Forum (TM1);
- Tasmanian *HealthConnect* Trial Phase 1 Baseline Report, November 2002 (T1);
- Tasmanian *HealthConnect* Trial Phase 1 Interim Report, January 2003 (T2);
- Tasmanian *HealthConnect* Trial Phase 1 April Report, April 2003 (T3);
- Tasmanian *HealthConnect* Trial Phase 1 Final Report, August 2003 (T4);
- Tasmanian *HealthConnect* Trial Phase 1 Research Report 1, January 2003, (T12);
- Tasmanian *HealthConnect* Trial Phase 2 Baseline Report, January 2004, (T5);
- Tasmanian *HealthConnect* Trial Phase 2 First Report, May 2004, (T6);
- Tasmanian *HealthConnect* Trial Phase 2 First Report Appendices, May 2004, (T7);
- Tasmanian *HealthConnect* Trial Phase 2 Final Report, November 2004, (T8);

- Tasmanian HealthConnect Trial Phase 2 Final Report Appendices, November 2004, (T9);
- Tasmanian HealthConnect Trial Phase 2 HealthConnect / MediConnect Baseline Report, June 2004, (T10); and
- Tasmanian HealthConnect Trial Phase 2 Checkpoint Evaluation Review, July 2004, (T11).

Some of the evaluation materials provided for review were in draft form.

2.3.1 The Classification Framework

The sheer volume of lessons learned meant that some kind of classification framework was required to sort and categorise the identified lessons. In reviewing options for the classification framework, the following features were regarded as desirable:

- The framework should be useful to trials and State and Territory implementations;
- The framework should be comprehensive (provides the capacity to classify all the lessons identified and the topics that are applicable to HealthConnect); and
- The framework should be accessible and understandable.

Three potential source documents were considered in the development of the classification framework for the HealthConnect Lessons Learned Report.

Those source documents were:

- The Implementation System Lifecycle for Information Systems (Composite structure developed from PRINCE 2³, and The Project Management Book of Knowledge⁴);
- The HealthConnect Business Architecture (Version 1.9, November 2004); and
- The HealthConnect Implementation Approach (Strategic Results Chain) (Version 1.0, November 2004).

In consultation with the Department, it was agreed that the HealthConnect Business Architecture version 1.9 (BA) provided the best framework for two reasons:

1. Lessons learned can be reinforced by relating them directly to BA concepts, providing a directly relevant context for the lesson, ensuring a high degree of utility for implementers; and
2. The identification of areas of the BA where there are no known lessons - identifying areas requiring greater consideration by States and Territories during implementation.

The BA therefore provides the context for recording the lessons learned and applying the lessons within initial HealthConnect implementations. However, both the Implementation

³ PRINCE 2 (Projects in Controlled Environments) Office of Government Commerce, London, UK

⁴ Project Management Book of Knowledge, Project Management Institute, North Carolina, USA

System Lifecycle and the Strategic Results Chain have their strengths, and relevant aspects of these have been incorporated into the latter sections of the framework, particularly those dealing with implementation issues.

2.4 Consultation Process

The consultation process on the first draft report was in two parts:

1. A workshop with the *HealthConnect* Trial Managers and the *MediConnect* Field Test Managers; and
2. Individual meetings with *HealthConnect* implementation teams and stakeholders in Tasmania, and the Northern Territory trial.

The feedback from the consultations was used to prepare the second draft report.

The second draft report formed the basis of a second workshop with the *HealthConnect* Trial Managers and the *MediConnect* Field Test Managers. The feedback from the second workshop has been used to finalise this report.

2.5 Timeframes

The timeframe for the project was as follows:

- Commencement of the project early January 2005;
- First draft of the Lessons Learned Report – 14 February 2005;
- Completion of the consultations and second draft of the Lessons Learned Report – 14 March 2005 for discussion with the Department;
- Second workshop 4 and 5 April 2005; and
- Complete final Lessons Learned Report – 8 April 2005.

2.6 How to Use This Document

Sections 4 through to 11 of this Lessons Learned Report are based directly upon the section headings in the BA v1.9. Section 3 has been used to present the context of the trials that forms part of section 1 in the BA. From section 12 onwards, the section headings are taken from the Strategic Results Chain⁵.

Much of the BA addresses national issues of coordination and control that have not been tested in Field Test and trials and where there are no lessons learned thus far. These empty sections are retained in the Report in order to ensure the lessons learned are aligned with the BA sections and to identify the areas of the BA where there is no evidence to inform

⁵ The *HealthConnect* Implementation Approach, Version 1.0, November 2004.

implementation planning. Similarly, initiative headings from the Strategic Results Chain (sections 12 onwards) may also be without any identified lessons learned.

The analysis of the source materials, including where there is either agreement or divergence in Field Test and trial findings, or where the lessons learned conflict with the BA are found in the main body of this report. Not all sections of the report have analysis, particularly where there is very little evidence to justify comment.

The source materials used in producing the lessons learned report may be found in the Appendices along with the references to the original source documents. The volume of references in some areas has necessitated further classification in order that the material is more digestible.

Within each section of the report, the lessons learned are listed with an indication of the strength of the lesson in brackets after each lesson. The term ‘strength’ refers to the strength of the supporting material. The broad classifications of strength used are:

- Strong - the lesson is supported by quantitative information such as a survey with significant numbers of respondents, telephone interviews with significant numbers of respondents, consistent evaluation findings across all the trials and Field Test or the analysis of a sufficiently large amount of data;
- Moderate – the lesson is supported by repeated instances in qualitative reports (for example, from consumer interviews or focus groups, provider focus groups), multiple observations by evaluators or surveys with medium numbers of respondents; and
- Limited – the lesson is supported by isolated instances of comments by trial staff, consumers, providers or single observations by evaluators.

3 Phase 1 and Phase 2 Field Test and Trials

Section 3 of the Business Architecture covers the *HealthConnect* Principles. Whilst an analysis could be conducted of the lessons learned against each principle, this would have resulted in significant repetition of the analysis presented later in the report. Instead we have used this section to describe the context for the Field Test and trials covered in section 1 of the Business Architecture.

The trials and Field Test described are:

- The Tasmanian trial of *HealthConnect*;
- The Northern Territory trial of *HealthConnect*;
- The North Queensland trial of *HealthConnect*; and
- The *MediConnect* Field Test (Ballarat and Launceston).

It is important to recognise that the Tasmanian and Northern Territory trials and the *MediConnect* Field Test have all included formative evaluations. The use of formative evaluations has meant that the trials and Field Test have learned from their own experiences and have evolved over the duration of the trial or Field Test.

3.1 Tasmanian *HealthConnect* Trial

The Tasmanian trial of *HealthConnect* was based in and around Hobart. In Phase 1, the trial was restricted to the Clarence Municipality of Hobart. In Phase 2, the trial was expanded to include all of the area covered by the Southern Tasmanian Division of General Practice. The trial was restricted to consumers over the age of 18, with an existing diagnosis of diabetes mellitus (either Type I or Type II), who resided in the specified region or whose GP's practice was in the specified region.

The Phase 1 objectives of the trial were:

- Provide an initial demonstration of the concept of *HealthConnect*;
- Act as a point of reference for implementation issues faced by other trials and projects;
- Provide evidence concerning the four research questions for a report to the Health Ministers on the research and development stage;
- Pilot certain data collection techniques; and
- Inform the refinement of the questions and the issues to be explored in later trials or projects.

The trial was widely advertised in the media, at the Royal Hobart Hospital and in participating GP practices. GPs also approached those patients meeting the trial's age and condition criteria regarding joining the trial. Thereafter, consumer enrolment (including consent and registration) was undertaken by the Trial Office staff either at the Trial Office, or, by trial staff visiting consumers in their own homes.

The *HealthConnect* trial went live in October 2002. At the end of Phase 1 (30 June 2003), 384 consumers were participating in the trial.

Participants in the Phase 1 trial included:

- 10 GP practices;
- The Royal Hobart Hospital (Emergency Department, Endocrine Clinics, Diabetes Education, all inpatient services, Pathology, and Radiology); and
- Hobart Pathology (a private pathology service).

In all, 1244 GP event summaries were created, 1741 pathology tests were authorised and included in *HealthConnect*, 200 endocrine clinic or diabetes education event summaries and 100 discharge event summaries (inpatient and emergency department) were created.

The trial was extended for 12 months in order to give more time for evaluation. Thus the main objectives of Phase 2 of the trial were:

- To continue to test the *HealthConnect* concept in a live setting including key components of the proposed *HealthConnect* architecture; and
- TO involve additional health care providers including optometrists, podiatrists, ophthalmologists, endocrinologists, anaesthetists and private hospitals.

The other objectives of Phase 2 of the trial were:

- Improving communication between the Royal Hobart Hospital and general practice through the increased availability and timeliness of agreed key consumer clinical information;
- Contributing to improved decision making about care through improved access to key clinical information and some level of decision support;
- Empowering consumers through increased capacity to manage, access and contribute to their own health information management;
- Supporting improved management of care and outcomes for the participating consumers;
- Contributing to the broad information management agenda within the Tasmanian Department of Health and Human Services;

- Supporting increased information technology and information management skill levels within the Tasmanian health care workforce; and
- Contributing to the lessons of the e-health agenda including consent, privacy, security and information standards.

Phase 2 was extended by 5 months to November 2004 to enable the integration of *MediConnect* functionality into *HealthConnect* to be evaluated. Community pharmacies went live in the use of *HealthConnect* in May 2004.

At the end of Phase 2 (actual end date was 30 November 2004 but 30 September 2004 was the census date for the evaluation) 877 consumers were participating in the trial. Participating providers included:

- 23 GP practices (91 ‘active’⁶ GPs)
- The services of the Royal Hobart Hospital from Phase 1 supplemented by the eye clinic, and podiatry;
- Hobart Pathology;
- A private ophthalmologist;
- 4 podiatry practices;
- 2 optometry practices;
- A group of anaesthetists;
- 8 community pharmacies; and
- Diabetes Australia (diabetes educators).

The provider survey at the end of Phase 2 was sent to over 270 participating providers across all of the health care settings included in the trial.

In Phase 2, 2601 GP event summaries were created, 4627 pathology tests were authorised and included in *HealthConnect*, 388 endocrine clinic or diabetes education event summaries were created, 132 podiatry and 70 eye clinic event summaries were created and 186 hospital discharge event summaries (inpatient and emergency department) were created. Private podiatrists created 196 event summaries, optometrists created 61 event summaries and the ophthalmologist created 30 event summaries.

The features of the Phase 1 consent model were:

- By participating, consumers consented to:

⁶ Active is defined to mean that they had created at least one event summary

- The GPs in their nominated GP's practice(s) (if participating) being able to view their *HealthConnect* record at any time but having to seek consent on a consultation by consultation basis to create event summaries;
 - All participating providers in the Royal Hobart Hospital being able to view *HealthConnect* at any time but having to seek consent to create event summaries;
 - The emergency department of the RHH being able to view any unauthorised⁷ pathology results ordered by a GP;
 - Hobart Pathology being able to view their pathology results at any time for quality assurance purposes; and
 - The *HealthConnect* information being used for evaluation purposes.
- Consumers could limit the information to be included in the initial health profile;
 - Consumers could withhold information from any event summary;
 - The consumer could ask for any information already recorded on *HealthConnect* to be removed;
 - Consumers could request in writing a copy of their *HealthConnect* record and the list of persons who had accessed it;
 - Consumers could change their nominated GP practice(s); and
 - Consumers could withdraw at any time and their information would no longer be able to be viewed but still could be used for evaluation purposes.

In Phase 2 the changes to the above consent model were:

- Providers no longer had to seek consent to create event summaries but the consumer had the right to say 'no' to the creation of event summaries or withhold item(s) of information from event summaries;
- Consumers could consent to nominated additional private practices having access to *HealthConnect* including a number of community pharmacies, private optometrists, private podiatrists, Diabetes Australia and a private group of anaesthetists. For each type of private practice, consumers could nominate all participating practices, a specific practice or no practices of that type.

GPs in the trial used a modified version of their clinical information system (Medical Director) to create *HealthConnect* event summaries, authorise pathology results from Hobart

⁷ Unauthorised refers to GP ordered pathology tests not yet authorised by the GP for inclusion in *HealthConnect*

Pathology and download certain information from the *HealthConnect* repository. GP's viewed *HealthConnect* using a web-browser launched from their clinical information system.

Event summaries from GP practices were sent on a 'store and forward' basis to the repository in the Royal Hobart Hospital using the HealthLink secure electronic data interchange technology. In Phase 2, GP practices could alternatively use HeSA certificates for secure data interchange instead of HealthLink.

Providers in the Royal Hobart Hospital did not have a clinical information system in place for the electronic creation of discharge summaries. As part of the *HealthConnect* trial, functionality was provided for discharge event summaries to be created electronically for participating consumers on discharge. This task was performed using either the emergency department information system or a web-browser. A web browser was also used to create event summaries for clinic consultations in the hospital.

The community pharmacies extracted information from the repository and viewed information in the *HealthConnect* repository via a web browser launched from their prescribing software (Rex) but were prevented from viewing pathology results due to unforeseen consent limitations. They could indicate in the repository that medicines were dispensed without creating event summaries as well as creating event summaries to include Over-The-Counter (OTC) medicines.

Hobart Pathology was limited to only being able to view pathology results for quality assurance purposes. The group of anaesthetists could only view *HealthConnect* and not create event summaries.

There was a range of views including cumulative information available from the *HealthConnect* repository and the default view on first access to *HealthConnect* (the critical view) was a composite view of event summaries.

Consumers could view *HealthConnect* and also add comments that could include their blood sugar level readings.

3.2 Northern Territory *HealthConnect* Trial

The Northern Territory trial of *HealthConnect* was based in the Katherine Region covered by the Katherine West Health Board and the Sunrise Health Service. The trial has a potential population of approximately 3,500 consumers receiving health services through the four participating community health services at Wurli Wurlinjang (in Katherine), Barunga, Timber Creek and Yarralin. The Katherine hospital also participates in the trial producing event summaries for inpatient discharges. In the trial, there were no event summaries created for outpatients or emergency department presentations.

The objectives of the trial are;

- Playing a role in identifying the value and feasibility of *HealthConnect* in remote regions of Australia;
- Making the delivery of health care services better for providers and consumers by making the health information available where and when it is needed; and
- Helping the mobile population of the Katherine region gain a better continuity of care across different service providers through the electronic exchange of health event summaries.

Registration of consumers started in March 2003 and by December 2003 had reached 1000. As of September 2004 the total number registered had reached a little over 1200, representing approximately 40% of the available population. The trial included 52 registered providers and 4 provider organisations.

At 30 September 2004, 613 community health event summaries and 134 hospital discharge event summaries had been created and 49 records had been viewed. By 31 March 2005, these numbers had increased to 3099 community health event summaries, 185 hospital discharge summaries and 82 records viewed.

The features of the consent model used in the trial were;

- By participating, consumers consented to:
 - The inclusion of an initial health profile;
 - The inclusion of event summaries in the *HealthConnect* repository subject to registered participating providers seeking consent on each and every occasion;
 - The viewing of the *HealthConnect* repository by registered participating providers, subject to providers seeking consent on each and every occasion;
- Consumers could limit the information to be included in the initial health profile;
- Consumers could withhold information from any event summary;
- Consumers could request in writing a copy of their *HealthConnect* record and a list of persons who had accessed it;
- Consumers could withdraw at any time and their information would no longer be able to be viewed but still could be used for evaluation purposes.

The trial's Governing Board has since reviewed the Northern Territory consent model and from July 2005, providers will no longer have to specifically ask for consent to send event summaries to *HealthConnect* or to view *HealthConnect* but consumers will have the right at any time to say 'no' to these activities taking place in relation to their record. Practice standards have been built into the privacy framework to make providers aware of issues culturally sensitive to consumers. Consumers also can request any information already recorded on *HealthConnect* to be made unavailable for viewing.

A range of clinical information systems are used to create event summaries. The community health service systems include Communicare, CCTIS, PCIS (being introduced as a new system replacing CCTIS) and Ferret. The hospital uses Jade Care Clinical for preparing discharge summaries and the associated event summaries. The event summaries from all systems take the form of .pdf files and are sent securely to the repository. Providers can view the event summaries by having the respective .pdf files representing the event summary sent to them by secure email for viewing locally. There is no concept of different views of the repository information, instead, registered providers can request selected event summaries from the consumer's record.

3.3 North Queensland HealthConnect Trial

The North Queensland trial is based in and around Townsville and focuses on the care of elective surgery patients. The objectives of the trial are to:

- Demonstrate the value of *HealthConnect* in a particular environment (peri-operative care);
- Inform the final design for the national *HealthConnect* architecture; and
- Test selective *HealthConnect* system components (for example, messaging and security).

The trial was initiated in March 2003 and went live in December 2003 for Queensland Health providers and in April 2004 for GP providers. At the time of the baseline report (August 2004), the Townsville Hospital, two GP practices and one other Queensland Health facility were participating. As of July 2004, 7 practices and 39 GPs have consented and registered and are waiting for their practices to be connected. The trial was extended to June 2005 and by 31 March 2005 the number of practices participating was 13 and the number of registered GPs was 65.

Staff from the trial management approached consumers from elective surgery waiting lists at the Townsville Hospital to participate. At the 30 June 2004, 1214 event summaries had been lodged in the repository belonging to 93 consumers. Approximately 40% of the event summaries were pathology results and 20% were surgical notifications. By the 6 April 2005, the number of participating consumers was 550 and the total number of event summaries had grown to 4608. These event summaries comprised approximately 35% pathology results, 27% surgical notifications and 11% radiology results. Referrals made up 10% of the event summaries and hospital discharges made up a further 7%.

The consent model used in the trial was based on the revised consent model from the Tasmanian trial. Consent is informed and based on the principle that the consumer controls the content of the *HealthConnect* repository.

On enrolment in the trial, the consumer consents to:

- Their nominated GP practice(s) contributing to their *HealthConnect* record;
- Blanket consent for all registered providers in the Townville Hospital to view their record (initially registration has been granted only to the providers directly involved with the surgical units). Access control lists can also be defined to limit access by providers to specific information types.

Participating consumers may at any time;

- Change consent, for example the nominated GP practice;
- Withdraw consent by contacting the Trial Office; and
- Request for their records no longer to be viewable (that is, withdraw from the trial);
- Request a copy of the audit log of those persons who have accessed their record; and
- Obtain a complete copy of their *HealthConnect* record in printed form or view it in the Trial Office.

The responsibility lies with the consumer to advise their provider if they do not wish information to be included (say 'no') in the *HealthConnect* repository otherwise consent is assumed.

Participating GP practices either use Medical Director or the Plexus clinical information system from Spectrum. These systems communicate event summaries to the *HealthConnect* repository using the Argus messaging software. GPs cannot directly view the *HealthConnect* repository because of security concerns identified by Queensland Health at that time. Instead, two types of event summaries (the surgical event notifications and the hospital discharge summary) are securely messaged back to GPs. The surgical event notification keeps GPs informed of status changes to the patient's booking. The discharge summary is sent when the consumer leaves hospital after surgery. These messages are seamlessly presented to the GP within their own clinical system.

Providers within Queensland Health can view *HealthConnect* securely. The information they can view within *HealthConnect* include radiology reports, pathology results, the health profile, GP updates, hospital discharge summaries, anaesthetic assessments and surgical event notifications.

3.4 **MediConnect Field Test (Ballarat and Launceston)**

The objectives of the *MediConnect* Field Test were to:

- Test the *MediConnect* system as a whole to ensure that there was full integration of the policy, operational and technical components involved in the registration, consent, lodgements and retrieval of prescription details and business processes;
- Test the performance of the operational and technical elements including the central database, interfaces between the prescription writing software and prescription dispensing software and the *MediConnect* functionality, the communications infrastructure and the blocking and key word functionality;
- Test the effectiveness of the communication strategy including the recruitment of providers (doctors and pharmacists) and consumers, education and training of providers, communication materials for consumers, and support mechanisms for all participants;
- Assess the ease and the usefulness of *MediConnect* for participants; and
- Identify the issues that need to be addressed prior to *MediConnect* being introduced nationally.

The *MediConnect* Field Test was conducted at two sites (Ballarat and Launceston). The design of the Field Test was in two Phases, the first to be conducted over three months and the second to be conducted over six months, although the actual duration of the Field Test considerably exceeded these time frames.

In Phase 1, the design was to progressively build the complexity of the Field Test starting with one community pharmacy (and one dispensing system) and one GP (and one prescription writing package) and a limited number of consumers in Launceston initially. Then through a series of stages the number of consumers, community pharmacies and GP practices participating was increased in both Launceston and Ballarat. The Field Test also increased the number of pharmacy dispensing systems in operation to two during Phase 1.

In Phase 2, additional functionality was provided, including medicines information blocking, the use of keywords, emergency access, the use of agents and the recording of Over-The-Counter (OTC) medicines and medicines background information. Phase 2 also included a second prescription writing package. A hospital in each location (Launceston General Hospital and Ballarat Base Hospital respectively) and an aged care hostel in Ballarat became part of the Field Test in Phase 2 and they were able to view the *MediConnect* information via a web browser.

The technical testing started in March 2003 and Phase 1 commenced on 30 June 2003. By November 2003 the Field Test comprised 10 GPs, 10 pharmacists and 369 consumers and the decision was made that the Field Test had substantially satisfied Phase 1 performance criteria and was ready to move to Phase 2 when the software became available. Phase 2 commenced in June 2004 once the functionality was available in all software products used

by participating providers. The Launceston General Hospital began participating in September 2004 and Ballarat Base Hospital in October 2004. The Field Test ended in December 2004 with 62 GPs, 37 pharmacies and 3095 consumers participating over both locations.

Consumers were mostly recruited and registered by the participating GPs and pharmacists as part of the conditions of provider participation. This process turned out to be a far more time consuming process than was initially anticipated mainly due to the time required to gain informed consent. Later in the Field Test, practice staff undertook some of the registration activity. The Health Insurance Commission (HIC) and Medicare offices, in addition to undertaking registration of consumers, could at the consumer's request, also add information to the background medicines and medicines events, including the recording of over-the-counter medicines in Phase 2 of the Field Test.

The consent model gave the consumer power to give consent to a GP of choice (identified by prescriber number) and a pharmacy (identified by pharmacy approval number) of choice. Consumers could either give verbal consent at each visit to their provider and this allowed viewing of the central record for 24 hours or give the provider ongoing written consent to view up to a specified end date.

The consent model included:

- Voluntary participation ('opt-in');
- Consumers could withdraw at any time;
- Consumers could block access to certain information (Phase 2);
- Consumers could select whether their record could be accessed in an emergency (when they might not be able to provide consent) (Phase 2);
- The use of agents to provide consent on the consumer's behalf (Phase 2);
- The use of keywords (passwords) for authorising access to the consumer's record (Phase 2); and
- Consumers could get a copy of their medicines history and also a list of providers who had accessed their medication record.

A total of 110,774 messages were successfully sent through the course of the Field Test representing the lodging of 9,295 prescriptions and the dispensing of 34,272 prescription medicines within the secure *MediConnect* environment. A distinguishing feature of the Field Test was that the messaging occurred in real time. 42,503 accesses of the Consumer Medication History were recorded.

The software used in the Field Test consisted of:

- Medical Director and Locum3 prescription writing software used by GPs; and
- WiniFRED and Rex Prescription dispensing software used by community pharmacies.

4 The HealthConnect Solution

This section of the report summarises the elements of the HealthConnect solution implemented and tested by the Field Test and the three HealthConnect trials.

4.1 HealthConnect Concept

4.1.1 HealthConnect Scope

The scope of the systems used within the Field Test and trials are shown in the following table.

Field Test or trial	Scope
MediConnect Field Test	<p>Provider's own clinical systems were used for the creation of event summaries and the viewing of medicines information.</p> <p>GPs used one of two types of prescription writing software and Community Pharmacists used one of two types of prescription dispensing software.</p> <p>Two hospitals, a nursing home and a hostel had web browser viewing capabilities.</p>
Tasmanian trial	<p>Provider's own clinical systems were used for the creation of event summaries by GPs, the Emergency Department and Community Pharmacists.</p> <p>The use of web browser facilities for HealthConnect event summary creation by all other providers, including all other hospital providers.</p> <p>Web browser viewing of HealthConnect by all providers, including GP providers.</p> <p>Web browser facilities for consumer viewing and the addition of consumer comments.</p>
Northern Territory trial	<p>Provider's own clinical systems were used for event summary creation and viewing event summaries retrieved from HealthConnect (Community health centres – 4 different systems and Hospital discharge summary system)</p>

Field Test or trial	Scope
North Queensland trial	<p>Provider's own clinical systems were used to send messages for the creation of event summaries and receive secure messages to view event summaries within GP clinical systems (2 types of GP systems were in use)</p> <p>Queensland Health developed the system for creating event summaries in the hospital and the interfacing of hospital systems. The I portal was also developed by Queensland Health for registered Queensland Health users to view the repository.</p>

4.1.2 HealthConnect Participants

The primary participants of the Field Test and trials are shown in the table below

Field Test or trial	Consumers	Providers
MediConnect Field Test	Adults in Launceston or Ballarat recruited by participating GPs and Community Pharmacists	GPs Community Pharmacists Hospital Nursing Home and Hostel
Tasmanian trial	Consumer had to have the condition of diabetes mellitus Type I or II and be aged greater than 18 years and live or have their GP's practice within geographical areas	GPs Community Pharmacists Hospital Providers (Diabetes Educators, Endocrinologists, Emergency Department, Eye Clinic, Podiatrists, Pathology, Radiology, Ophthalmology, Inpatient doctors and nurses) Private Providers (Podiatrists and Optometrists, Ophthalmologist and Anaesthetists) Hobart Pathology (private pathology) Diabetes Australia

Field Test or trial	Consumers	Providers
Northern Territory trial	Consumers predominantly traditional Indigenous Australians recruited within the Katherine Region.	Community Health Centres (Doctors, nurses and Aboriginal Health Workers) Hospital Providers (Only inpatient doctors and nurses)
North Queensland trial	Elective surgery patients at the Townsville Hospital	GPs Hospital Providers (Surgical Outpatients, Day Stay and Inpatient Units, Operating Theatres, Pathology and Radiology)

4.1.3 HealthConnect Service Roles and Services

The roles and services deployed in the Field Test and trials, as defined by the *HealthConnect* Business Architecture (version 1.9) are shown in the table below.

Field Test or trial	Roles and Services
MediConnect Field Test	Consumer Registration and Management Provider Registration and Management HealthConnect Repository HealthConnect Consumer Access Services eHealth Message Bank Services Supporting HealthConnect ICT infrastructure
Tasmanian trial	Consumer Registration and Management Provider Registration and Management HealthConnect Repository HealthConnect Consumer Access Services Provider eHealth Access Services eHealth Message Bank Services Supporting HealthConnect ICT infrastructure

Field Test or trial	Roles and Services
Northern Territory trial	Consumer Registration and Management Provider Registration and Management HealthConnect Repository HealthConnect Consumer Access Services eHealth Message Bank Services Supporting HealthConnect ICT infrastructure
North Queensland trial	Consumer Registration and Management Provider Registration and Management HealthConnect Repository HealthConnect Consumer Access Services eHealth Message Bank Services Supporting HealthConnect ICT infrastructure

4.2 HealthConnect System

4.2.1 The HealthConnect EHR

The event summary types used in the EHR of the Field Test and trials are summarised in the table below.

	Field Test	Tasmania	Northern Territory	North Queensland
Event Summary Types	<p>Medication Background Information (MBI)</p> <p>Message types were used to amend the MBI and to maintain the consumer medication history (CMH) including prescribing and dispensing events, OTCs and blocking</p> <p>Messages types were used to manage consumer, provider and agent registrations</p>	<p>Background (IHP)</p> <p>GP</p> <p>Pathology</p> <p>Radiology</p> <p>Emergency Department discharge summary</p> <p>Inpatient discharge summary</p> <p>Outpatient Clinic (Endo)</p> <p>Eye Clinic</p> <p>Podiatry</p> <p>Diabetes Education</p> <p>Optometry</p> <p>Consumer</p>	<p>IHP</p> <p>Community Health Centre</p> <p>Inpatient discharge summary</p> <p>Pathology</p>	<p>Referral(IHP)</p> <p>GP Update</p> <p>GP Investigation</p> <p>Inpatient discharge summary</p> <p>Pathology</p> <p>Radiology</p> <p>Anaesthetic Health Assessment Questionnaire</p> <p>Surgery Event Notification</p>

4.2.2 The HealthConnect Repository

The nature of the repositories used in the Field Test and trials are contained in the following table

Field Test or trial	Repository Type
MediConnect Field Test	DB2
Tasmanian trial	SQL Server (Windows 2000)
Northern Territory trial	Firebird Open Source Database (Windows 2000 Advanced Server)
North Queensland trial	SQL Server (.NET framework)

4.2.3 Core HealthConnect EHR Functionality

The EHR functionality is summarised in the following table.

Function	Field Test	Tasmania	Northern Territory	North Queensland
Register Providers and Consumers	Provider	Trial Office	Trial Office	Provider and Trial Office
Create Event Summaries	Provider	Provider and Consumer	Provider	Provider
Manage Access to EHR Consent to access	Given at point of care; or Ongoing access to nominated providers	Nominated Practices (GP Community Pharmacy and Private Providers); and All hospital Staff; and Limited access for Pathology Providers	Consent to view required at point of care for all providers	Nominated GP practices sent secure messages Authorised providers in Queensland Health

Function	Field Test	Tasmania	Northern Territory	North Queensland
<p>Manage Access to EHR Information</p> <p>Views available</p>	<p>Consumer Medication History</p> <p>Medication Background Information</p>	<p>Range of Views</p> <p>For example:</p> <ul style="list-style-type: none"> • Critical View • Current Medication View • Alerts View • Pathology View • Event summary • Diabetes Monitoring View • Consumer comments View 	<p>Selected event summaries are downloaded</p>	<p>Single Portal with filters for Queensland Health</p> <p>GPs limited to the content sent via surgery notifications and discharge summaries</p>
Incorporate into local records of CIS	Yes	Yes	No	Yes
Integrate into local records of CIS	No	Yes (Medication and Pathology)	No	No
HealthConnect notifications	No	<p>Discharge notifications</p> <p>Screening and complications notifications</p>	No	Surgical event notification
Secondary uses	Evaluation	Evaluation	Evaluation	Evaluation

Function	Field Test	Tasmania	Northern Territory	North Queensland
eHealth Value Added Services		Screening and complications reminders		
eHealth Message Bank Services	Prescribed Medications	Prescribed Medications Pathology Results Downloads available for range of information from the repository	Event summaries	GP Referrals Surgical event notifications and discharge summaries Pathology Results

5 Consumer Participation

5.1 Benefits of HealthConnect to Consumers

The MediConnect Field Test and HealthConnect trials were framed around a strong consumer centric model. This model meant there was considerable attention paid to obtaining consumer and consumer representatives' feedback on many facets of the work program.

There was broad agreement amongst consumers in both the MediConnect Field Test and the Tasmanian trial regarding the benefits of HealthConnect, particularly in terms of access to health records in an emergency and when travelling in Australia and overseas. The ability of HealthConnect to reduce the burden on consumers having to recollect past health care events and maintaining their own medication lists are also seen as beneficial.

The focus of consumer feedback in the Northern Territory trial reflects the priorities of Indigenous communities both in terms of consumer empowerment (through participation, consent and controlling access to their health records), and on supporting improved health care delivery in remote areas of Australia through better access to health information.

There is no doubt that consumers have very high expectations regarding the benefits of HealthConnect. The management of consumer expectations, particularly in terms of the frequency of provider use of HealthConnect will be important. Field Test and trial feedback suggests that consumers expect providers to use HealthConnect routinely, when in reality, providers are only likely to view HealthConnect on an as-needs basis. Consumer marketing materials may need to address this issue, particularly as many consumers regarded their HealthConnect experience as a "non-event" because the use of HealthConnect often takes place when the consumer is not present and there was very little acknowledgement of HealthConnect during provider consultations.

Consumer feedback on access to their HealthConnect records in the Tasmanian trial was highly favourable, with some consumers indicating that they found access to their HealthConnect record reinforcing, allowing them to better understand their medical condition. The positive consumer feedback from Tasmania suggests there may be opportunities for HealthConnect to play a role in assisting some consumers to comply with their management regimes. However, some providers suggested that the trial participants in general tended to be those consumers with good levels of compliance, and that it was the non-participants of the trial whose compliance needed to be improved.

Lessons learned are:

- Consumer expectations of HealthConnect were high and will need to be managed in the implementations (Strong);

- Consumers expect benefits in terms of:
 - Consumer empowerment (Strong);
 - Access to health records in an emergency and when traveling (Strong);
 - Reduced requirement to recollect past health care events (Strong); and
 - Reduced requirement to maintain medication lists (Moderate).
- Participants in Indigenous communities found they learned more about the availability of health services in their region (Limited);
- Consumers with direct access to their health record found:
 - Access allowed them to better understand their condition (Moderate); and
 - Pathology trends were useful as was medicines information (Moderate).

5.2 Consumer Consent to Participate

5.2.1 Consent Principles

The basic consent principles emerging through the experiences of the Field Test and trials are:

- Consumers and providers have to ‘opt-in’⁸ to participate (Strong) although some consumers and many providers thought that *HealthConnect* should be ‘opt-out’⁹;
- By consumers registering in *HealthConnect*, providers may assume that:
 - The participating provider may send information to the *HealthConnect* repository (Strong);
 - The participating provider may view information in the *HealthConnect* repository (Strong); and
 - The participating provider may send information to another participating provider via a secure electronic message (Moderate).
- Consumers have the right to say ‘no’ to *HealthConnect* information being added (withheld) or being seen (with providers either being excluded from viewing the *HealthConnect* record at all, or where certain items are blocked from view) (Strong);

⁸ Opt in means that you have to elect to participate otherwise it is assumed you are not a participant

⁹ Opt out means that you have to elect not to participate otherwise it is assumed you are a participant

- Consumers have the right to withdraw any item of information from the *HealthConnect* repository at any time (Strong). This right includes withholding or blocking information from their past health care records that might otherwise be included in the *HealthConnect* record (Strong); and
- Consumers have the right to withdraw from *HealthConnect* at any time (Strong) and from that time none of their information in the *HealthConnect* repository will be available for viewing by anyone (Moderate).

Secondary uses of the *HealthConnect* repository (such as, research, health service planning and consumer selection for clinical trials) have not been explored in any real detail by the trials, although preliminary findings suggested that most consumers believe the use of de-identified data for secondary uses would be acceptable (Limited).

5.2.2 Current Consent Model

The consent principles proposed in the Business Architecture have, to a large extent, taken on board the findings of the Field Test and trials and provide a workable consent model for the initial *HealthConnect* implementations. While the majority of consumers participating in evaluation activities have indicated that the proposed model is satisfactory, there are numerous instances cited where consumers feel that providers should be responsible for requesting consumer consent to submit information to *HealthConnect* (i.e. that the onus be on the provider). However, such a model proved highly unpopular with providers and necessitated a change in consent arrangements in the Northern Territory, Queensland and Tasmania. This is an important issue that could be explored further in the initial *HealthConnect* implementations.

Feedback on the consent arrangements mainly occurred through consultation with consumers already participating in the Field Test and trials. The *MediConnect* evaluations also incorporated quantitative studies with non-participating consumers both in the locations of the Field Test and elsewhere. The non-participating consumers surveyed were selected on the basis of a recent experience of the health system, and may not be representative of the broader population. A total of 413 non-participating consumers were interviewed for the survey and 77% of these non-participating consumers said that they would join a national system although a third said that they would need more information. The respondents not interested in joining *MediConnect* (n=80; 19% of all non-participating survey respondents) were not specifically asked why they would not, some understanding of their reasons can be inferred from the concerns they had about participating.

Apart from this evidence, the trials did not specifically measure the extent to which the actual consent arrangements prevented consumers from participating in the Field Test and trials. On the basis that it is reasonable to suppose that consumers participating in the Field Test and trials were largely satisfied with the consent arrangements, the validity of the trials' consent findings may not be representative of the views of the wider population. However, when the consent arrangements changed in the Tasmanian trial between Phase 1 and 2 very few of the participating consumers withdrew because of the changes to the consent

arrangements. On the other hand, GPs in several practices new to the trial in Phase 2 found that consumer participation rates were down in comparison to participation rates they had experienced in other trials.

There is a fine balance between providing the information necessary to ensure informed consent and overwhelming consumers with what can be perceived as unnecessary information, risking consumer alienation. Ensuring that consumers fully understand consent significantly complicates the registration processes and there is substantial feedback relating to the content of consent and registration materials. Striking the balance is key and there may be merit in making consent information available to consumers without forcing consumers to read it (for example, by confining much of the detail to the “small print”). Focus testing consent and registration materials with consumers and consumer organisations could help find the correct balance. The Field Test and trials have produced many valuable lessons regarding consent and registration materials that could provide the starting point for focus testing activities.

The Tasmanian consumers had no concerns regarding the emergency access override although the findings of the *MediConnect* Field Tests are inconclusive because many consumers did not choose this option when it became available later in the Field Test. However, most consumers perceive emergency access as one of the main benefits of *HealthConnect*.

In only in one of the trials were there specific findings of consumers withdrawing from *HealthConnect*. Here two thirds of consumers were content that their *HealthConnect* records would be de-activated and unavailable for viewing. The most frequent reason for withdrawals during the trials other than at the point of re-consenting was because the consumer had died.

In conclusion, consumer consent is undoubtedly one of the most complex and controversial aspects of *HealthConnect*. The Business Architecture has now clarified the consent arrangement, taking on board many of the initial lessons learned from the Field Test and trials. However, there are aspects of the proposed consent model that could be refined based upon subsequent evaluation feedback from the Field Test and trials. There would be merit in testing the proposed consent model, including these refinements, more widely with consumers and their representative organisations in parallel with *HealthConnect* implementation planning.

The lessons learned are:

- A simple consent model is required so as not to overwhelm consumers (and providers) (Strong);
- Whilst consumers prefer that the provider ask them for consent, the most popular consent model identified by providers for both adding information to *HealthConnect* and viewing of *HealthConnect* was for the provider to assume consent unless the consumer says ‘no’. This model is accepted by consumers (Strong);

- The NT has identified the requirement for consent to provider viewing to be established at the provider level not at the provider organisation level due to kinship issues (Moderate);
- Most consumers expect and agree that their *HealthConnect* information would be accessed in an emergency (Strong);
- Sustainability of consent arrangements has to rely on professional ethics standards to guide the behaviour of providers (Limited);
- Most consumers were content their record would be unavailable for viewing by anyone if they withdrew rather than requiring the record to be permanently deleted (Limited);
- Most providers were concerned about the completeness of the record if consumers could withhold information but recognize there will be always be the chance that information missing in the record and they had to live with that fact (Strong); and
- A small number of consumers will not participate irrespective of the consent model (Limited).

5.2.3 Access Control Arrangements

The evaluation findings across trials suggest a general preference by consumers for expanding provider access to their *HealthConnect* records rather than restricting access. This preference is based upon the principle of consumer trust in their health care providers. However, there were consumers in the Field Test and trials that have identified the need to specify individual provider-based access. For example, in the Northern Territory trial some consumers were concerned that relatives (who were providers) could get access to private information. In the Tasmanian trial most consumers selected only nominated community pharmacies to have access to their *HealthConnect* record largely because they trusted the pharmacist(s) at that location.

The Business Architecture does not include provision for blanket consent arrangements, even though such arrangements are favoured by a large percentage of consumers. As a result, large numbers of consumers registering for *HealthConnect* will be forced to make consent choices that they would not otherwise choose to make. Given the general applicability of blanket consent findings across the Field Test and trials, it would be appropriate to consider the inclusion of a blanket consent option within the Business Architecture and initial *HealthConnect* implementations. However, it is recognised that such a model comes with a greater degree of complexity that may not be possible to achieve within the timeframes of initial *HealthConnect* implementations, particularly in the absence of national consumer and provider identification systems.

Difficulties associated with using keywords in the *MediConnect* Field Test (for consumers authorising provider access) suggest that the use of keywords may need to be reconsidered particularly in the context of the workflow at the point of service delivery.

Lessons learned were

- Consumers generally prefer expanding provider access rather than restricting it. This stems from the trust they have in the providers (Strong);
- Many consumers wish to give blanket access to all legitimate health care providers. This should be considered an option for implementations (Moderate);
- There are specific instances where consumers require the ability to either grant named providers' access or to restrict access by named providers (Moderate). This is a particular concern of indigenous consumers;
- Most consumers would give their nominated pharmacy access to their pathology results (Limited); and
- There were many problems associated with the use of keywords not the least of which was remembering them (Moderate).

5.2.4 Privacy of Consumer Records

Consent is an important aspect of the management of consumer privacy. This inter-relationship between privacy and consent often makes separating out these issues in terms of the evaluations very difficult for the Field Test and trials. The operation of consumer consent within the Field Test and trials is the physical manifestation of consumer's controlling their rights to privacy. Privacy is underpinned by complex jurisdictional based legislative, policy and operational activities that are difficult to understand, let alone experience by consumers participating in the Field Test and trials. As a result, a main focus of evaluation in the Field Test and trials has been the consent arrangements.

The main findings of the Field Test and trials in relation to the impact of privacy on participation are:

- The majority of consumers had no privacy concerns with deciding to participate or not to participate in the *HealthConnect* program (Strong); and
- Those consumers that were most interested in privacy arrangements of the program tended to fall into a particular demographic, that is, 25 - 40 years without complex or chronic health conditions. (Strong)

The lessons learned are:

- The mechanisms to safeguard privacy seemed to add a great deal of complexity to *HealthConnect* registration processes (Moderate);
- Certain kinship relationships need to be acknowledged in terms of the proposed privacy and access arrangements (Limited);

- Once information held within *HealthConnect* is printed or downloaded into provider clinical information systems, the privacy of consumer information is no longer protected by the *HealthConnect* consent model, but instead relies on the privacy legislation governing personal health information held by organisations (Strong); and
- Privacy was a factor for a small number of consumers in deciding whether or not to join the various trials of *HealthConnect* (Moderate).

5.2.5 Consumer Responsibilities

Please refer to section 5.2.1.

5.3 Consumer Registration

5.3.1 Identification of Consumers

Considerable effort was required by the Field Test and all trials in putting in place systems and processes to support consumer identification. These processes, like many other aspects of the Field Test and trials, were often make-shift arrangements such as additional stickers on paper medical records, specifically to support the temporary requirements of the Field Test and trials.

As temporary arrangements, many processes were either time or cost constrained, and as such, many of the experiences of the Field Test and trials in relation to consumer identification have little bearing on the implementation of *HealthConnect* going forward. For example, in the Tasmanian trial each clinical system was updated to indicate whether the consumer was a participant in the trial irrespective of whether the consumer was expected to use the service. The only exception to this approach was the community pharmacy system identification where only the pharmacies nominated by the consumer were changed to indicate participation. If the consumer nominated all pharmacies, no indication was made in any pharmacy and it was up to the pharmacist to arrange the inclusion of the consumer.

Consumers expected their providers to know they were participants in the trial without being told. Many consumers were surprised that providers did not acknowledge the consumer's participation. The bar coding of prescriptions was a useful mechanism for community pharmacists to recognise trial participants.

Wherever there was a delay in the registering of consumers (for example, the *MediConnect* Field Test) or where the process was not under tight central control (for example, the Northern Territory trial), there was the potential for consumers to be registered more than once. In the Field Test the HIC was responsible for picking up any duplicate registrations. Duplicate registrations created problems later when information had to be sent to the consumer's record. The Northern Territory trial reports the existence of information belonging to the same consumer spread across a number of records.

The HealthConnect Business Architecture has indicated that registration and identification in HealthConnect implementations will be based upon the Medicare smartcard, with the smartcard jointly serving Medicare and HealthConnect.

Consumers in both the MediConnect Field Test and the Tasmanian trial have indicated their support for a combined HealthConnect / Medicare card. Very few consumers have any concern with the use of the Medicare number for HealthConnect identification purposes. In the Field Test, consumers were supportive of the use of both the Medicare card and the Department of Veterans Affairs number in the registration process.

However, the Northern Territory trial has highlighted the additional complexity of consumer registration and identification for traditional Indigenous Australians, including the limitations of using identification cards. However, community pharmacists in the Northern Territory expect an improved capacity for identifying traditional Indigenous Australians arising from HealthConnect registration processes.

The lessons learned were:

- Centralized control of registration processes will be required to avoid the duplication of registrations and overcome the impacts of delays in the registration process (Moderate);
- Some consumers were reluctant or not able to give accurate birth date information often considered an essential component of identification (Moderate);
- It is unlikely that HealthConnect will be able to be implemented nationally without a unique health care identifier (Moderate);
- There is a need to know whether a consumer is already registered with HealthConnect (Strong).
- The Business Architecture has indicated that registration and identification will be based on the Medicare smartcard. This approach was widely accepted by consumers (Strong); and
- Specific means of identification may be required for traditional Indigenous Australians. Smartcards are likely to be used and some other form of identification may be needed instead of a PIN (Moderate).

5.3.2 Initial Registration Process

Registration processes varied within the Field Test and trials. In the MediConnect Field Test, registration was undertaken initially by GPs and pharmacists, but increasingly was devolved to practice staff due to time constraints. In the Northern Territory, trial project officers registered consumers at their home communities following an information session about the trial. In the Tasmanian trial, Trial Office staff undertook the registration mainly through a one-on-one session either in the consumer's own home or at the Trial Office.

The registration of consumers by providers (GPs and pharmacists) in the *MediConnect* Field Test proved unacceptable to providers for a number of reasons, not least because of the complexities of the consent process and the time required in explaining the consent process to consumers in order to ensure informed consent. The Business Architecture has incorporated the lessons learned from the *MediConnect* Field Test and does not propose a provider registration process.

However, the Tasmanian trial reported increased levels of consumer recruitment following receipt of GP initiated recruitment materials and the *MediConnect* Field Test indicated that consumers were more likely to attend HIC registration sessions following the recommendation of their provider. This feedback suggests that providers should have a key role in initiating consumer participation in *HealthConnect*.

Trial Managers' feedback included the suggestion that *HealthConnect* should support provider-initiated referrals. Such an approach recognises the importance consumers place on provider recommendations regarding *HealthConnect* participation without unduly burdening providers with the details of the registration and consent process. Such an approach also fits well with the sensitivities and pressures of a consultation, provides consumers with an opportunity to reflect prior to making a decision to participate in *HealthConnect*, and ensures the necessary follow-up / recall activities by the *HealthConnect* Authority or appointed agent in due course.

Trial staff in the three *HealthConnect* trials conducted consumer registrations and consumers regarded highly the face-to-face registration process. Unfortunately, such a registration model would be prohibitively expensive if applied on either a state or national basis, although the Business Architecture recognises the need for assisted registrations in some cases.

Consumers and providers across the Field Test and trials acknowledged the complexities of the consent and registration processes and the impact of these complexities on the time required to undertake registrations, as well as the implications for informed consent when registration time was constrained. Initial *HealthConnect* implementations need to consider carefully how registration and consent material is presented, taking into account the considerable consumer and provider feedback identified in section 5.2.2 above. The goal of *HealthConnect* implementations would be to streamline the registration process, reduce the time required for consumer registration and minimise the number of assisted registrations that are required because of consent complexity.

In the Field Test and all trials registration was an assisted process with trial staff or providers explaining and leading the registration process. None of the trials included on-line registrations.

The lessons learned were:

- A single registration process is required that includes the option for consumers to nominate all their providers to have access to the consumer's *HealthConnect* record (Moderate);

- Providers registering consumers is not a practical option for national *HealthConnect* implementations (Strong);
- However, providers should have a key role in initiating consumer participation (Strong). The possibility of referring consumers to a registration agent for follow-up should be explored in initial implementations (Moderate);
- Where project or practice staff are used for consumer registration the significant resource implications will need to be addressed (Moderate);
- Registering consumers while they are attending clinics is an acceptable way of enrolment (Limited);
- Consumer on-line registration options need to be explored in initial *HealthConnect* implementations (Strong); and
- Registration materials need to be streamlined on a “need-to-know” basis. Shorter information booklets were found to be more useful for explaining consent although some consumers want the option to refer to more detailed information (Moderate).

5.3.3 Establishing the Initial Health Profile (IHP)

The evaluation feedback specific to the IHP is fairly limited. However, the extensive feedback regarding the content of *HealthConnect* doesn’t tend to differentiate between the IHP, the event summaries and the *HealthConnect* views. As such, the findings identified in sections 9.6 and 6.4.1 below also need to be considered in relation to the IHP.

The Business Architecture proposes the extraction of summary information such as current diagnosis, allergies and medication records from the systems of nominated providers.

The quality of information within provider systems is often very poor, particularly in terms of its currency, with providers often “cleansing” their data before generating referral letters, diagnostic test requests or other clinical documentation. The Tasmanian trial included a process of data cleansing for trial participants that is unlikely to be affordable on a national scale. It is unclear whether provider records will be cleansed prior to IHP information being extracted and how this will occur. Much of the feedback associated with the event summary content in section 9.7 below relates to the quality of the information available within *HealthConnect* and the impact on provider utility if EHR information is not perceived to be quality information.

The IHP represents the starting point for the Electronic Health Record (EHR) and it is essential that the IHP contain quality information, particularly in terms of provider confidence. The Tasmanian trial feedback has suggested the importance of “medically screening” or “interpreting” the content of the IHP, and the principles of such an approach (not withstanding the technical and financial challenges associated with it) may find wider favour with providers generally. The *MediConnect* Field Test only allowed the entering of the Medication Background Information in the IHP and it did not include the consumer’s list of current medicines. As a result, it took a considerable time for a sufficiently complete consumer medication record to be established, with implications for provider utility.

The Business Architecture recognises the importance of the IHP for certain populations (citing chronic disease groups and consumers with important allergies and alerts as examples) rather than the entire population, which would reduce the costs associated with providing a screening facility.

The Business Architecture proposes mechanisms for allowing consumers to update the IHP, addressing consumer feedback, but it is unclear whether update facilities will be available to providers and the mechanisms by which providers will be able to maintain the content of the IHP.

Family history is an important part of the consumer's health information that requires clinical interpretation (in terms of its relevance to the consumer) and it is unclear why this aspect of the clinical content of the consumer's EHR has been singled-out in the BA for consumer updating without the need for provider validation.

The lessons learned were:

- The quality of information in provider systems is often not suitable to transmit to *HealthConnect* and has to be cleansed (Strong). The implications of auto-generating the IHP from information within provider clinical systems are therefore unclear;
- The Tasmanian trial has suggested that medical input is required to prepare a suitable IHP or to validate an IHP that is either brought together by others, such as practice staff, or is electronically generated from the content of provider information systems. Any effort required to clinically validate the IHP will need to be appropriately resourced (Moderate);
- The Northern Territory trial has suggested that the IHP be created as part of the process of registration otherwise there is a tendency for it to be overlooked (Moderate). Such an approach is complicated where providers are not involved in the registration process, and this issue may be better addressed through systems integration and change management;
- Providers did not want to 'go live' without the IHP loaded onto *HealthConnect* as the IHP is seen as something useful to many providers from the outset and forms the starting point for building the *HealthConnect* record; (Moderate); *and*
- The *MediConnect* Field Test demonstrated how slowly the record is built up if an IHP is not loaded (Moderate).

5.3.4 Ongoing Identification

Please refer to section 5.3.1.

5.3.5 Cancelling Registrations

No lessons identified in this report.

5.4 Consumer Interaction with *HealthConnect*

5.4.1 *HealthConnect* Consumer Access Services

Please refer to section 5.4.2.

5.4.2 Consumer Access to their Health Records

In the Field Test and trials, consumers could request paper copies of the information contained in the repository although this function was rarely used. Consumers could also request a report from the Trial Office (and the HIC in the Field Test) that showed who had accessed their *HealthConnect* / *MediConnect* record. Again this facility was rarely used. The Tasmanian trial was the only trial where consumers had direct access to their own *HealthConnect* records and consumers could obtain an on-line report on who had accessed their record.

The first Tasmanian consumers were trained in the use of their record in February 2003 and over the entire period of the trial approximately 140 consumers (15% of participants) were trained to access their own *HealthConnect* records electronically. In Phase 2 consumers could additionally obtain a list of people that had accessed their record and they could also add comments to their *HealthConnect* records which providers could view.

Through a series of consumer focus groups and specific surveys of those trained to access their own *HealthConnect* records, feedback was obtained as to the consumers' perceptions of the quality and the value of the information within *HealthConnect*.

Some consumers had difficulty logging in to *HealthConnect* after their training session because the structure of the password was confusing. However, once this barrier was overcome, the usage was mostly occasional viewing after a consultation.

The majority of consumers found some value in accessing *HealthConnect*, although for many trial consumers, particularly consumers with co-morbidities and consumers with private health care, the *HealthConnect* records were incomplete due some of their providers not being part of the trial. Because of this, consumer interest in the content of their *HealthConnect* records was probably less than it might otherwise have been.

The main benefits consumers identified when accessing their *HealthConnect* records included:

- Using *HealthConnect* as a reminder of the discussion during previous consultations;
- Reviewing the dates of previous consultations when booking future consultations;
- Reviewing the results of previous diagnostic tests; and
- Being better able to understand their medical condition.

Several consumers accessing their records thought that they had a better understanding of their medical condition as a result of the use of their *HealthConnect* record. If this is indeed the case, the potential for *HealthConnect* to improve consumer compliance with their management regimes should be explored further in initial *HealthConnect* implementations.

Most consumers agreed that the physical representation of *HealthConnect* in the Tasmanian trial was not intuitive in comparison to other web sites, although consumers were not overly concerned with the response times of *HealthConnect*. However, consumer experiences in relation to response times may not be representative of the wider population due to the higher than average age of trial participants.

Phase 2 of the Tasmanian trial included the implementation of decision support by way of complication screening facilities that included provider reminders of overdue clinical events and a complication screening view available to providers and consumers. While delays in implementation of the complication screening facilities meant that consumers were not in a position to evaluate this functionality, consumer feedback did identify the need for consumer notifications regarding when something had changed in their *HealthConnect* records (primarily so that consumers knew when to view *HealthConnect*) as well as notifications on overdue appointments (section 6.4.5 below).

The lessons learned were:

- The design of the consumer access portal needs to be very simple and intuitive. It also needs to consider the varying requirements of consumers (Strong);
- Consumers sometimes struggled to understand some of the clinical content suggesting that consumer presentations of the clinical content should be different to the format (ie plain English) used for providers (Strong);
- The majority of consumers found some value in accessing their own health record directly (Moderate);
- Many consumers, particularly those with private health care providers, found the record to be incomplete and therefore of less value. This highlights the importance ensuring the full range of providers are participating for the care required by the consumer (Moderate);

- Consumers had no mechanism to inform them of when new information was on their health record (Moderate); and
- Consumers interviewed as part of the Phase 2 interim evaluation report thought *HealthConnect* should remind consumers and providers of due or overdue health care events (Limited).

5.4.3 Consumer Direct Interaction

Please refer to section 5.4.2.

5.5 HealthConnect Consumer Access Portal

Please refer to section 5.4.2.

5.6 Consumer Value Added e-Health Services

Please refer to section 5.4.2.

6 Health Care Provider / Organisation Participation

6.1 Benefits of HealthConnect to Provider / Organisations

The North Queensland trial has demonstrated that benefits can accrue to all the participating providers in a HealthConnect trial. The benefits in the trial included:

- For GPs, the receipt of notifications of changes to the surgical waiting list status of their patients (previously not available) and the prompt receipt of discharge summaries from hospitals (previously often arriving after the consumer has been seen by the GP following surgery); and
- For hospital staff, the ability to prepare good discharge summaries quickly (using pre-populated templates that included information provided electronically by the GP on referral and at subsequent consultations prior to surgery), and the incorporation of hospital patient management information.

The MediConnect Field Test showed the potential for significant efficiency savings through community pharmacists not having to re-key medicines information and the availability of registration information for consumers new to the pharmacy. Pharmacists also found access to information on consumer allergies and other comments useful as this information was previously unavailable to them.

The hospitals in the Field Test saw the potential for a more streamlined admission processes resulting from direct access to a patient's current medication record as well as reducing the risk of adverse drug reactions.

GPs in the Field Test saw the potential value in knowing what had occurred outside their care, when a hospital specialist had provided treatment or prescribed medicines.

In the Northern Territory trial there are real benefits to a mobile population that can present multiple times with the same condition to different providers within a very short space of time. The potential benefit for avoiding interactions between treatments and medicines could be significant.

In the Tasmanian trial, community pharmacists saw benefit in being part of HealthConnect, as did the private allied health providers. These providers have traditionally operated in an information vacuum, and like the GPs in the North Queensland trial, were able to access information about their patients that was previously unavailable, at least routinely. The potential for efficiency savings for community pharmacists through avoiding the re-keying of prescription data was also applicable in the Tasmanian trial, although the demonstration of this benefit was hampered by delays in the medication message process and the low number of consumers nominating participating pharmacists.

Diabetes educators in the Royal Hobart Hospital found efficiencies from using the HealthConnect templates to prepare letters electronically for GPs (and for their own records) and being able to view which diabetes monitoring events had occurred.

GPs in the Tasmanian trial were more cautious in their optimism about the value of *HealthConnect* recognising the potential increased time impost during a consultation and the limited number of occasions where they found new information in *HealthConnect* that affected their clinical decision making or patient management.

The demonstration of benefits during the Field Test and trials were limited due to the constraints under which the Field Test and trials operated. These constraints included:

- Relatively small numbers of consumers presenting at provider consultations making it difficult to embed *MediConnect* and *HealthConnect* thinking and workflow within provider business processes;
- Limited trial scope in some cases, limiting the availability of clinical information available to providers;
- Incomplete care chains necessitating that providers use both conventional and *HealthConnect* processes;
- The need to maintain existing paper-based records due to the temporary nature of trials;
- The availability of paper copies of event summaries (particularly discharge summaries) negating the need to view the *HealthConnect* repository. In this regard, the trials proved to be a catalyst for improvements in existing processes;
- Technical issues preventing provider use, including poor access times, operational problems (particularly script messaging and scanning of barcodes in community pharmacies) and poor data quality; and
- Inadequate infrastructure (number of access points, telecommunications limitations (broadband coverage) and / or lack of clinical systems for specific disciplines) within some sectors making access and use of *HealthConnect* more difficult.

Notwithstanding the current limited nature of demonstrated benefits, most providers believe that *HealthConnect* will deliver benefits when implemented nationally. In the Tasmanian trial's final evaluation¹⁰ for example, 74% of providers responding to the survey indicated that they would participate in a future *HealthConnect*, albeit with reservations in some cases. Understanding provider reservations will be pivotal in implementing a *HealthConnect* model that is acceptable to providers.

It is also clear that the value proposition varies for each of the provider groups that have been involved in the Field Test and trials. GPs across the Field Test and trials have been consistent in their concerns, particularly in terms of benefit vis-à-vis increased consultation times and therefore increased costs (although the North Queensland trial is the exception as GPs are reported to value the elective surgery notifications that they receive from *HealthConnect*).

¹⁰ Phase 2 Final Evaluation Report, February 2005

The biggest challenge for initial *HealthConnect* implementations will be in demonstrating benefits to GPs, and to a lesser extent the private specialists.

There is a significant body of evaluation feedback from GPs in the Field Test and trials that is essential in informing and shaping initial *HealthConnect* implementations. Key to GP participation and benefits realisation will be the demonstrable benefits, integration with workflow, and change management and infrastructure support as well as extensive consultation and involvement of GPs in the implementation process. While GPs may perceive that they have least to gain from *HealthConnect*, their active involvement in implementation planning will ensure that when they do need to use *HealthConnect*, there is value in doing so.

Public hospitals are a potentially difficult provider group in terms of realising benefits from *HealthConnect* without a major overhaul of the information technology infrastructure available to support hospital-based providers and a systemic change management program that focuses on the benefits of *HealthConnect* participation. While there is significantly less evaluation feedback material from hospital providers, there is sufficient feedback to frame an implementation model that supports the use of *HealthConnect* in a way that delivers real benefits to hospital-based providers. The use of electronic templates to produce discharge summaries sourced from *HealthConnect* and hospital treatment information should increase the efficiency and timeliness of the preparation of these important documents.

A *HealthConnect* implementation model that delivers benefits for hospital-based providers will also mean greater value to GPs through the prompt availability of inpatient and emergency event summaries delivered electronically – one of the main benefits of *HealthConnect* identified by GPs.

The lessons learned were:

- The Field Test and trials have identified potential benefits to providers through the use of *HealthConnect*. However, it is important to recognise the impact of the trial constraints (as identified above) on their realisation during the Field Test and trials (Strong);
- Most providers believe *HealthConnect* will deliver benefits in a national roll-out (Strong);
- The value proposition varies for each of the provider groups:
 - Primary care providers have been consistent in their concerns particularly of tangible benefits versus increased consultation times (Strong);
 - Hospitals expect benefits in the preparation of discharge summaries and the availability of information on referral or emergency admission (Moderate); and

- Community pharmacists and other private providers expect benefits in participation because they were able to access information that they did not have before (Moderate).
- The biggest challenge for implementations will be in demonstrating benefits to primary care providers and private specialists (Strong); and
- The key to provider participation will be demonstrable benefits, integration with workflow and change management and infrastructure support (Moderate).

6.2 Provider Participation Boundaries

6.2.1 Scope of Provider Participation

Both providers and consumers have indicated that to be useful, the content of the *HealthConnect* records need to be comprehensive in terms of the range of contributing providers. Most providers get the greatest value from receiving information from a particular set of providers, for example, GPs are most interested in information from hospitals about emergency department attendances and inpatient discharges, whereas hospitals are most interested in medicines and investigation information from other providers. Without comprehensive provider participation, the summary record will not contain all the potential information that should be in *HealthConnect* and participating providers will need to maintain multiple communication mechanisms (for example, electronic, facsimile, and paper) in order to communicate with both participating and non-participating providers. Such a scenario significantly detracts from the utility of *HealthConnect*.

One of the main benefits of *HealthConnect* for each provider group is the availability of information submitted by other provider groups. This is submitted to *HealthConnect* without the need to know who the recipient might be as is required in point to point communications. This sharing of information amongst any authorised providers is a benefit that lasts beyond the time the information is added to *HealthConnect*.

Consumers accessing their own records have also indicated that they would obtain greater utility from their *HealthConnect* records if all of their providers were participating. For example in the Tasmanian trial consumers still carried their own medication records because some providers (particularly specialists) did not have access to, or contribute to *HealthConnect*.

There is broad agreement across the Field Test and trials that a critical mass of providers is necessary for *HealthConnect* to be useful both to providers and to consumers.

The Field Test and trials also identified the need for a critical mass of consumers in order that *HealthConnect* can become embedded within provider workflow. Such an approach would seem advantageous for public hospitals and private providers, but the GP position is

less clear. GPs across the Field Test and trials have been consistent in their concerns, particularly in terms of benefit vis-à-vis increased consultation times. The Tasmanian GP's requirement that *HealthConnect* implementations "go slow, start low" also suggests that GPs would prefer less rather than more consumers participating in *HealthConnect*, at least initially.

If these evaluation findings hold true, then an alternative implementation model may need to be considered, initially focusing on getting the infrastructure right in public hospitals and embedding *HealthConnect* event summary creation / electronic discharge summaries within hospital provider workflow for ALL consumers - prior to the involvement of GPs and private providers. The Northern Territory and the Tasmanian trials have highlighted the need to better use clinical information systems within hospitals as a pre-cursor to implementing *HealthConnect*. Resolution of hospital infrastructure and embedding *HealthConnect* within hospital provider workflow would improve the timeliness and quality of inpatient and emergency department discharge summaries to GPs. Such an approach would provide an incentive for GPs to participate in *HealthConnect*, as most GPs perceive the availability of timely inpatient and emergency discharge summaries delivered electronically as the major benefit of *HealthConnect*.

With the participation of GPs and other private providers, a further round of change management would be required in public hospitals to ensure that hospitals take advantage of the benefits of GP contributions – for example, by accessing *HealthConnect* in pre-admission clinics, on admission, on attendance at emergency department, at the time of hospital discharge and during outpatient consultations.

Alternatively, if we accept the evaluation findings that GPs won't view *HealthConnect* routinely, then providing that the GP contributions to *HealthConnect* can be implemented in a way that does not impact the GP workload (a significant but not insurmountable challenge); there may be early benefits for all other providers in delivering the critical mass of consumers up-front.

Clearly, the scope of provider coverage is a key challenge for initial *HealthConnect* implementations as they balance the need to manage the scope and risk of initial implementations against the ability to deliver early benefit to the first tranche of providers.

The lessons learned were:

- A critical mass of consumers is required to embed *HealthConnect* within provider workflow (Strong);
- A critical mass of providers is required to minimise the need for alternative provider communication channels (Strong);
- A comprehensive set of providers is required that completes the care chain in order to deliver benefits to participating providers. Each specific group of providers has most to gain from participation by one or more other groups of providers (Strong);

- Infrastructure and change management in the hospital sector will be key to providing the benefits that GPs are seeking (Strong); and
- Providers need to have the choice to ‘opt-in’ to *HealthConnect* (Strong) although most consumers believe all providers should have to participate (Strong).

6.2.2 Provider Organisations and Individual Providers

Please refer to section 6.2.1.

6.2.3 Provider Identification

Please refer to section 6.2.1.

6.2.4 Provider Registration

Please refer to section 6.2.1.

6.2.5 Authorisation of Providers

Please refer to section 6.2.6.

6.2.6 Provider Authentication

Provider authentication has clearly been problematic for the Field Test and all trials, although the *MediConnect* Field Test indicated that the establishment of a working *MediConnect* connection (including PKI), while problematic at the outset, only impacted provider workflow for the initial period until problems were resolved.

There is no doubt that the Field Test and trials were attempting to implement new technology and unfamiliar concepts within time constrained implementation plans. The net result was that provider authentication proved to be a considerable challenge for the Field Test and trials, forcing some trials to make alternative arrangements to the HeSA PKI certificates in order to meet trial timeframes.

The importance of provider authentication became a ‘show-stopper’ for the North Queensland trial which was unable to provide secure remote access to the *HealthConnect* repository for participating GPs as originally planned. Authentication requirements were resolved by sending secure messages to the GPs from the *HealthConnect* repository and making these messages available within GP clinical information system(s).

While the solution to provider authentication is unclear from the evaluation feedback, it does suggest that initial implementations need to resolve the technical issues prior to commencing

HealthConnect roll-out. The Field Test and trials have recorded provider dissatisfaction with this aspect of HealthConnect. Therefore, it is essential that the technical issues associated with provider authentication and the management of PKI certificates are resolved and bench-tested thoroughly prior to their implementation, in order to eliminate the risk of alienating participating providers at the outset.

Lessons learned were:

- Implementations should aim to have a single logon for provider authentication rather than separate logons for multiple servers and applications (Strong);
- Repeated provider authentication should be minimised (Moderate);
- The technical implementation of PKI certificates proved problematic and requires resolution prior to deployment in initial implementations (Strong); and
- The process of replacing PKI certificates can be time consuming and the effort devoted to administering them needs to be kept to a minimum (Limited).

6.2.7 Provider Responsibilities

Provider agreements were part of the Field Test and all the trials and they established the expectations of provider participation and were a necessary commitment by providers in order to obtain the incentives associated with the Field Test or trials.

The trials demonstrated the need for protocols to support the selection of information for inclusion in event summaries. Interviews and focus groups with provider groups reported a wide variety of interpretations of what content should be included. Implementations of HealthConnect will need to address this matter to ensure greater consistency in event summary content.

On occasion, some providers in Phase 1 of the Tasmanian trials forgot to seek consent each and every time that an event summary was created even though this was a responsibility accepted by each participating practice. This practice led to the change in the consent model in Tasmania as well as other trials.

In the case of the Field Test (Ballarat and Launceston) the agreements included targets for the enrolment of consumers in the Field Test by each participating provider. These targets were a source of dissatisfaction because of the costs incurred (time of the provider) in gaining informed consent from the consumer.

The lessons learned were:

- Providers were reluctant to sign contracts that had a punitive tone (Moderate);
- Future activities should establish a greater obligation on providers to participate in accordance with the participation arrangements (Limited); and
- Ongoing education and audit of providers regarding security will be required in the implementations of *HealthConnect* as the providers are often unaware of their local security measures (Limited).

6.2.8 Privacy and Confidentiality

Please refer to section 6.2.7.

6.3 Provider Interaction with *HealthConnect*

6.3.1 Provider eHealth Access Services

Please refer to sections 12.6 and 12.8.4.

6.3.2 Provider Clinical Information Systems Interfaces

Both the *HealthConnect* Systems Architecture and the Business Architecture recognise that *HealthConnect* will need to be inter-operative with provider clinical information systems in order to be effective.

The Tasmanian trial interface to the GP desktop enabled GPs to provide event summaries to *HealthConnect* without leaving the familiar environment of their local clinical systems. GPs were generally happy with the principles underpinning the creation and transmission of event summaries to *HealthConnect*. The approach used for event summary creation in the Tasmanian trial is the approach currently proposed in the Business Architecture. In the Northern Territory, event summaries could be generated by a single keystroke and were then in a format ready to be sent to the repository.

The Northern Territory trial evaluation included an analysis of data quality within the *HealthConnect* repository and demonstrates the importance of providers using clinical information systems if the information transmitted to *HealthConnect* is to be meaningful and accurate. While the Tasmanian trial did not report any data quality issues, a GP survey did demonstrate low levels of GP readiness in terms of being able to inter-operate with *HealthConnect* because many GPs do not utilise some of the facilities within the GP desktop that would be required for successful inter-operability with *HealthConnect*.

Inadequate hospital infrastructure, including the lack of clinical systems supporting provider workflow, is a further complication in terms of providers using clinical systems if data quality is to be ensured. Hospitals implementing clinical systems as a pre-cursor to implementing *HealthConnect* will need to ensure that providers implement these systems in ways that encourage uptake and use, supported by change management strategies that maximise provider benefits, in line with section 12.6 below. Only then will the information within the hospital clinical systems feeding *HealthConnect* be of sufficient quality to be relied upon by others.

Considerable evaluation feedback has been provided on the inter-operability between *HealthConnect* and community pharmacy dispensing systems for both the *MediConnect* Field Test and the Tasmanian trial. Key integration issues included the inability to match prescriptions with dispensed items, inherent lag times associated with prescription transmissions, scanner problems and performance degradation. Clearly, the main lesson here is for the end-to-end testing of integration components prior to wider implementation roll-out, particularly given the considerable technical problems experienced in the Field Test and trials and the impact of these technical problems on participating providers.

The Field Test and trials by their nature tested the issues associated with the deployment of the various components of an e-health system in clinical settings. Resolution of the emerging technical issues required the dedication of the trial resources, relied heavily on the goodwill from providers and meant that some specific aspects of *MediConnect* and *HealthConnect* could not be evaluated. It is essential for the initial *HealthConnect* implementations to address the management of these technical issues to the satisfaction of providers prior to commencing full *HealthConnect* deployment.

The cautious approach to implementation in the *MediConnect* Field Test, based upon the thorough testing of components at each stage of the implementation, would seem a sensible approach to implementation that might be considered by the initial *HealthConnect* implementations. It needs to be recognised though that any significant changes to functionality during this process will take time and the time required is compounded as the number of different clinical information systems involved increases.

In addition to the creation of event summaries, provider clinical information systems need to be able to support the viewing and navigation of *HealthConnect* information. In most trials this was achieved by the use of web browser functionality.

In the North Queensland trial, GPs could not directly access *HealthConnect*. Instead they were sent messages containing surgical event notifications and discharge summaries that were then read locally within their clinical information systems. This approach might have wider applicability as it eliminates the need to retrieve information from *HealthConnect* at the time of use and is more likely to be presented to the user with the same 'look and feel' as other parts of their clinical information system.

For *HealthConnect* to support clinical decision support functionality locally, it will be necessary to download *HealthConnect* information (particularly, medicines and pathology results) and integrate this information within the provider's local clinical information system.

This functionality was available to GPs and community pharmacists in Phase 2 of the Tasmanian trial. The Field Test and other trials allowed information to be downloaded locally but the information was not integrated into the provider's local clinical information system.

The lessons learned were:

- It is essential that the creation of the event summaries required by *HealthConnect* are produced as a by-product of the clinical processes undertaken by providers (Strong);
- Wherever possible, event summaries should be provided as a by-product of providers using existing clinical systems (Strong);
- The lack of clinical systems supporting provider workflow was a consistent problem identified across the trials. Although mainly identified as an issue in hospitals, the lack of clinical systems is also likely to be problematic in many other settings including amongst private specialists and other private providers (Strong);
- Functionality should be provided to download information into the local clinical information system and enable it to be integrated with the local data (Moderate);
- Careful consideration of the inter-relationship between the primary record (be it a provider's clinical system or the paper record) and *HealthConnect* is required in order to avoid duplication and ensure data accuracy (Moderate);
- End-to-end testing is essential as all trials experienced significant problems with interfacing and messaging between component information systems (Strong);
- Significant time must be allowed for any software changes required by provider clinical information systems and this may reduce the capacity to benefit from such modifications identified during the course of a trial (Moderate); and
- Provider re-education in how to make better use of existing clinical systems within the context of *HealthConnect* integration will be required (Limited).

6.3.3 HealthConnect Provider Access Portal

Please refer to section 9.7.

6.3.4 Value Added eHealth Services

Please refer to section 8.15.4.

6.3.5 eHealth Message Bank Service

Please refer to section 8.15.4.

6.4 Key Work Practice Implications

6.4.1 Creating Event Summaries

Hospitals

In hospitals, *HealthConnect* requires event summaries to be created as a result of outpatient clinic visits, emergency department attendances and inpatient discharges. Most hospitals in the trials did not use information systems for creating discharge summaries or clinic letters prior to commencement of the trial, although some had dictating facilities in support of these processes. As a result, the need to produce electronically generated event summaries for *HealthConnect* consumers became a new task for hospitals participating in the trials.

In the Tasmanian trial, some hospital doctors created event summaries themselves using *HealthConnect*, but hospital based Trial Office staff generated most event summaries. Once created, the event summaries were reviewed by the treating doctor, and when finalised, were sent to the *HealthConnect* repository (subject to the consumer's consent). Diabetes educators and podiatrists in the hospital largely created their own event summaries and the diabetes educators used the printed versions of the event summaries in place of their clinic letters to GPs. Hospital pathology tests and radiology reports were selectively included within the event summary.

In the Northern Territory, Katherine Hospital clinicians have increasingly used the electronic discharge summary system to create the inpatient discharge summaries that were sent to the *HealthConnect* repository as .pdf files. Hospital emergency department and outpatient clinic information was not captured as event summaries for inclusion in *HealthConnect*.

In the *MediConnect* Field Test, hospitals did not create event summaries and only had viewing access to the Consumer Medication History.

In the North Queensland trial, the hospital contributed five different types of event summaries. These are:

- Pathology results;
- Radiology results;
- A discharge (referral) summary;
- An Anaesthetic Health Assessment Questionnaire (AHAQ); and
- Surgery event notifications.

The discharge summary and Anaesthetic Health Assessment Questionnaire were held as version controlled files that were only submitted to the repository once they were designated as final documents. The discharge summary was presented as a pre-populated template that doctors found very useful because it brought together, electronically, information from a range of sources in a format that closely resembled what they normally used. Participating trial doctors are keen to use the facility for all patients. There has also been some discussion in the North Queensland trial as to whether the hospital discharge summary should be in two parts, one containing information for the GP to inform the ongoing management of care, and the second, a more detailed event summary to be held in the repository for use by the hospital in subsequent episodes of hospital care.

Providers found the hospital discharge summary event creation processes cumbersome to use in both the Tasmanian and Northern Territory trials, partly because of a lack of familiarity (due to small numbers of presenting consumers), but also because of the time requirements of creating event summaries in an environment where access to computers was fairly limited. In contrast, the North Queensland trial hospital providers are keen to use the discharge summary template facilities for all patients even though the discharge summary is only pre-populated with information for *HealthConnect* patients.

The North Queensland trial provides an example of how hospital doctors could be better supported in the production of discharge summaries and the use of *HealthConnect* information during the hospital stay. Much of the hospital discharge summary is pre-assembled using information from both *HealthConnect* and local hospital systems and only requires the doctor to review and edit the presented material prior to discharge.

More work will need to be done to find effective discharge summary solutions for hospitals that match the Queensland Health functionality and assist doctors in the preparation of the discharge summary as a pre-cursor to sending the discharge summary to *HealthConnect* as an event summary.

Community Health Centre Consultations

In the Northern Territory trial, event summaries were created by community health centres on a number of different clinical information systems. These summaries were saved as .pdf files that were then sent to the *HealthConnect* repository. The lack of clear business processes and problems with information systems has meant that not all event summaries were received in the *HealthConnect* repository or contained the expected content. The event summaries that were reviewed by the evaluators verified that important information was not necessarily included in every event summary.

Hospital Clinics

In the Tasmanian trial, event summaries were produced in hospital clinics using the *HealthConnect* event summary template web-browser facilities. The Tasmanian trial included some examples of clinic event summaries being produced by the clinician during or at the end of the consultation with notable improvements in the turn-around time for this information to be made available to GPs.

General Practice

In the Tasmanian and North Queensland trial, GP event summaries were created as a by-product of the consultation with many fields in the event summary pre-populated from information held within the GP's clinical information system. GPs could amend the pre-populated event summary before sending to *HealthConnect*, as well as delete the event summary if required (in which case no event summary was sent). There were no specific rules governing the content of what was to be sent to *HealthConnect* and hence the information sent was not consistent across GPs. Some GPs restricted the information sent to the consumer's diabetes related information while other GPs sent a much broader range of information to *HealthConnect*. Some GPs also sent amendments to the consumer's current medicines to *HealthConnect* when they received information on medication changes from the hospital discharge summary.

In the North Queensland trial, GPs started an episode of care by sending an initial health profile event summary that included the reason for referring the patient for elective surgery. They then sent subsequent event summaries that were either GP visit updates or the storage and forwarding of pathology results in the same way as the Tasmanian trial. In the Tasmanian trial, pathology test results ordered by GPs had to be authorised before they were included in the *HealthConnect* repository.

In the Field Test, GPs sent prescribed medication details to the repository through event summaries that were created as a by-product of the prescribing process in the two clinical information systems (Medical Director and Locum). The Medical Director system operated in real time in communicating with *MediConnect* and this caused delays because the script was not printed until the return message was received. On the other hand, the Locum system printed prescriptions without confirmation from *MediConnect* leading to GPs having to cross out barcodes on printed prescriptions if *MediConnect* failed to accept the message.

Overall, GP systems used in the trials were modified to make the creation of event summaries part of the workflow that seamlessly integrated event summary creation with the information already contained with their clinical information system. For some GPs the clinical information needed to be cleansed before the data quality was acceptable for sending to *HealthConnect*.

In the Tasmanian trial, event summaries were sent from the GP's clinical information system to the *HealthConnect* repository using a 'store and forward' system provided by the HealthLink software that sent them securely to the *HealthConnect* repository for updating. This process introduced a delay of up to twenty minutes. Implementations need to be assured that the approach selected for messaging GP prescriptions does not introduce an unacceptable delay that impacts upon the workflow between prescribing and dispensing. However, in the Field Test, prescription details were processed into *MediConnect* as soon as the details were lodged from the prescription writing software and then were available for uploading to the prescription dispensing software. The only delays in this process were the messaging times that totalled less than 30 seconds.

Private Providers

In the Tasmanian trial, private podiatrists and optometrists created event summaries directly using a web browser. This functionality was available as part of the *HealthConnect* repository. It was made available to those providers that either did not have their own clinical system or did not have a clinical system interfaced to *HealthConnect*. This worked well when computers were available at the point of care, however, most locations had to create the event summaries after the visit. Whilst specific event summary templates were created for the trial, some podiatrists did not feel the template allowed for all the data they collected at a consultation. They also felt that when *HealthConnect* was implemented on a State-wide basis, additional data items would be required to create event summaries for their wider client base.

Community Pharmacists

Community pharmacists in both the *MediConnect* Field Test and the *HealthConnect* Tasmanian trial could download prescribed medicine details from *HealthConnect* by scanning the barcode on the prescription generated by the GP's clinical information system. Pharmacists could also enter the prescription details directly from the original prescription. Pharmacists generally did not create event summaries in *HealthConnect* (although there was a provision for pharmacy interventions to be recorded as event summaries), instead the prescribed medicines were updated as dispensed on *HealthConnect*.

Community pharmacists in the *MediConnect* Field Test and the Tasmanian trial had difficulty using scanners to read the barcodes on the prescriptions for a variety of reasons including inherent lead times within the store-and-forward mechanisms (Tasmania), scanning software problems (Tasmania) and the quality of the barcode printing (*MediConnect* Field Test).

Both the Field Test and the Tasmanian trial reported delays to the dispensing process that often resulted in the prescription barcodes not being scanned, and the equivalent prescribed medicines not being downloaded and matched to the dispensed medicines.

In the *MediConnect* Field Test, pharmacists had to register consumers in the Field Test as well as dispense the medicines.

The lessons learned were:

- Many of the hospital staff found the electronic discharge summary systems to be cumbersome to complete and it was hard to get access to a computer for sufficient time to complete the summary (Moderate). Gearing up Hospitals to contribute event summaries to *HealthConnect* in a way that supports and streamlines hospital workflow is a key issue for *HealthConnect* implementations;
- However, some hospital providers preferred to create electronic discharge summaries rather than dictating summaries (Limited);

- Electronic discharge summaries were not being sent immediately after discharge. This delay severely reduces the effectiveness of *HealthConnect*, particularly in terms of providing the necessary incentive for GP use (Strong);
- GPs found the creation of event summaries easy as the creation had been integrated into their clinical system (Strong). However, the extent to which GPs use their clinical information systems to record clinical information currently could hamper the effectiveness and utility of GP event summary creation facilities;
- There was a lack of clinical protocols governing the content of event summaries, particularly for GPs (Strong);
- Pharmacists rarely found that the process of downloading scripts from *HealthConnect* was fast enough to match their re-keying of the data. Unless these issues are addressed, alternative mechanisms will be required to link the prescribed and dispensed medicines within *HealthConnect* (Strong);
- Business processes need to be carefully reviewed for opportunities to reduce pressures on providers (Moderate);
- *HealthConnect* acted as a catalyst for some workflow improvements (for example, paper based discharge summaries were received more quickly) (Limited);
- Business processes need to be examined in terms of the pharmacy dispensing process prior to deploying *HealthConnect* more widely for example, using forward dispensing to alleviate pressures on dispensing (Strong); and
- While pharmacists agreed that it could be their role to enter over-the-counter (OTC) medicines, they said it would not happen in busy periods (*MediConnect* Field Test), unless linked to the point-of-sale devices (Tasmania) (Limited).

6.4.2 Retrieving EHR Information

In the Tasmanian trial, most providers had unrestricted access to the *HealthConnect* record of their patients via the web browser facilities in *HealthConnect*. The main exceptions were Hobart Pathology that could only view pathology records for quality assurance processes and the community pharmacists that could not view pathology results. Access was provided through a series of views, many of which were composite views of information held within *HealthConnect*.

Providers using the viewing facilities over the Internet, (for example, GPs and podiatrists), found that the time taken for the views to appear was too long to allow browsing through the consumer's record and this factor discouraged viewing. It should be noted that there was an additional delay for the first view because of the security overheads remembering that most providers only saw at most one participating consumer in a day.

Consumers in the Tasmanian trial trained in accessing their *HealthConnect* records also had access to the same set of *HealthConnect* views. The delays in accessing information did not deter them and most spent between five to ten minutes looking at their record.

In the North Queensland trial, only Queensland Health's registered providers can view the *HealthConnect* repository using a web browser. The web browser provides access to a single view of all of the consumer's information held within *HealthConnect* with a filter to reduce the range of information provided. It is interesting to note that GP investigation results are the most commonly accessed events summaries by Queensland Health.

In the North Queensland trial, GPs are not able to view the repository directly due to security concerns - instead surgery event notifications and the final discharge summary are sent via a secure message to the GPs for viewing through their local clinical information system.

In the *MediConnect* Field Test, the main information that could be viewed was the consumer's prescription and the Consumer Medication History. This information could be downloaded to the GP's clinical information system but could only be viewed in a separate window to the current medicines information held in the GP's local system. This lack of information integration meant that some medicines could be overlooked. In the pharmacy dispensing systems used in the Field Test there was better integration of the information from *MediConnect* with the locally held pharmacy record. In contrast, the Tasmanian GP's current medicines are displayed together with the locally held medicines information from *HealthConnect* in the same window, supported by a common code set for medicines in the trial. This presentation reduced the risk that medicines would be overlooked. Further the common code set enabled the current medicines to be used with the local medicines in the decision support functionality of the GP's local system.

The two hospitals in the *MediConnect* Field Test adopted different approaches to the viewing of *MediConnect* information that resulted in quite different impressions of the value of the information in *MediConnect*:

- On admission, one hospital obtained written consent from the consumer and then printed a copy of the consumer's medicines history for inclusion in the paper medical record. Staff found this method of obtaining medicines information to be more efficient than contacting the consumer's GP or family. It is interesting to note that the time taken to access information from *MediConnect* (albeit 5 minutes for the full medicines history) is considered less significant when the information found is clinically relevant;
- The other hospital also obtained consent on admission but only included the consent in the medical record. At the time of the evaluation report none of the admissions staff had seen any *MediConnect* information and only the hospital pharmacy representative had accessed the *MediConnect* information electronically or seen a printout of the record.

The lessons learned were:

- For effective viewing of *HealthConnect* over public telecommunications infrastructure, optimisation techniques are required to maximise the ability of *HealthConnect* to cope with the volume of information that may be required within timeframes that are

satisfactory to clinicians. This requirement must be a priority of any *HealthConnect* design (Strong);

- The approach used to view *HealthConnect* event summaries was different in the Tasmanian and North Queensland trials because of Queensland Health security concerns (Strong);
- The process of sending hospital discharge summaries to GPs electronically used by the North Queensland trial, while in conflict with the current Business Architecture may have its merits in overcoming *HealthConnect* viewing performance for some providers, particularly GPs primarily seeking discharge summary information. The acceptability of providers receiving selected event summaries electronically should be explored (Moderate);
- Technical problems with scanners inhibited the downloading of prescriptions in the *MediConnect* Field Test (Limited);
- Community pharmacists in the Tasmanian trial rarely downloaded prescriptions mainly because the information was rarely available on *HealthConnect* due to script messaging delays (Moderate);
- Some prescription writing software prompts for whether *MediConnect* information should be provided whilst others require the prescriber to actively seek the information. The latter systems tend to result in far fewer uses of *MediConnect* (Limited);
- Hospital providers in one hospital in the Field Test found the process of accessing *MediConnect* records too time consuming for the current level of benefit gained (as there was little information of perceived clinical value available) (Limited). Tasmanian trial GPs also found the process of accessing *HealthConnect* too time consuming and often the only information in *HealthConnect* was information previously provided by them (Moderate);
- Only 10% of GPs in the Tasmanian trial acknowledged their decision making was better supported by *HealthConnect* (Moderate); and
- Community pharmacists have sought access to pathology results and most consumers are prepared for their nominated pharmacist to have access (Moderate).

6.4.3 Authorising Diagnostic Test Results

Although feedback regarding authorisation¹¹ of pathology results by GPs is limited, the issue is important when considering the implementation of *HealthConnect* on a wider scale because of the volume of results that would require authorisation prior to submission to *HealthConnect*.

¹¹ Authorisation refers to the process by which GPs are required to review pathology results before the results can be included in a consumer's *HealthConnect* record.

The Business Architecture suggests one possible solution in terms of a time period after which the results will become available whether or not the provider has released them. This and other options, including the exception handling solution identified in the evaluation feedback need to be considered in more detail in consultation with providers and privacy regulators.

6.4.4 Maintaining EHR Lists

Please refer to section 9.8.

6.4.5 Receiving Notifications

Notification is a process by which providers are notified that there is information of possible importance to be viewed within *HealthConnect*. The use of notifications reduces the need for providers to continually access *HealthConnect* to find out whether an expected piece of information (for example, a discharge summary) has been lodged.

In the North Queensland trial, GPs received surgical event notifications as the main process to advise them of changes to the status of their patients on the surgical waiting list. This was new information GPs did not receive previously and this information was considered valuable to them.

In Phase 1 of the Tasmanian trial, GPs were notified by facsimile that consumers had attended the Royal Hospital Hobart and that event summaries were available for viewing. In Phase 2 of the trial, e-mail notifications were sent to GP clinical information systems whenever a consumer attended the emergency department or was discharged from hospital. Notifications were also used as part of the trial's decision support functionality advising GPs when consumers needed to have tests done (based upon best practice guidelines, for example, HbA1c tests, foot checks etc). Additionally, any consumer initiated comment gave rise to a notification in the GP's clinical information system. Further in Phase 2, consumers were sent e-mails advising them that new information had been added to their record.

To be effective, notifications require the information within *HealthConnect* to be of the highest quality and currency. Over use of notifications will be self defeating because providers will tend to ignore them if they appear too frequently and turn out not to be of sufficient importance to warrant attention. Some of the notifications in the Tasmanian trial did cause angst, particularly where the provider had decided not to have a test performed and there was no way of turning off the generation of a notification.

The use of notifications has associated legal implications where a notification is sent and the provider does not act upon it. Consequently, consideration must be given to how providers acknowledge the receipt of notifications.

Because many GPs do not regularly use e-mail as part of their practice management, it is necessary for notifications to be sent directly to the GP's clinical information system in a way that does not disrupt the GP's workflow. The Tasmanian trial made use of the GP's

“unchecked pathology” box to lodge notifications as GPs are used to reviewing unchecked pathology periodically.

While the North Queensland trial’s use of notifications for advising changes in surgical status was considered beneficial, the feedback from the Tasmanian trial is inconclusive as much of the decision support functionality was only implemented late in the trial. However some elements of decision support could be usefully considered in conjunction with recall systems that a number of practices run as part of their screening for a range of conditions.

The Business Architecture version 1.9 does not contain notifications for decision support or screening type functions. Notifications are proposed for a limited range of critical events about consumers that provider(s) might not otherwise be aware of.

The lessons learned were:

- There is a need to provide notifications to GPs and other providers for key events relating to their patients (Moderate);
- Messages can be sent to provider clinical information systems and appear seamlessly within clinical systems, although such a “push” approach is not proposed within the Business Architecture. Such an approach would negate the need for providers to view *HealthConnect* for routine events such as hospital discharge but still requires them to recognise new information has arrived within their system (Moderate); and
- Email notifications are likely to be unsatisfactory, as many primary care providers do not use email routinely (Moderate).

6.4.6 Creating the Initial Health Profile

Please refer to section 5.3.3.

6.4.7 First Presentation at Health Care Setting

Please refer to section 5.3.2.

6.4.8 Managing Emergency Access

The concept of “access in an emergency” gives providers the right to access a consumer’s *HealthConnect* record in emergency situations when the consumer is unlikely to be able to give informed consent (for example, unconscious or suffering major trauma). Both the Field Test and trials have indicated that consumers regard emergency access to their health records be one of the main benefits of *HealthConnect* participation.

In the Tasmanian trial, consumers were required to give emergency access as a condition of trial participation. The Emergency Department of the Royal Hobart Hospital was also able to access any pathology results, including unauthorised GP pathology results in an emergency.

In the MediConnect Field Test, emergency access was only introduced in Phase 2 of the Field Test. While there was a 95% acceptance of emergency access by consumers newly registering in Phase 2, many of the consumers that registered in Phase 1 did not understand the need to specifically consent to the emergency access arrangement for Phase 2 of the Field Test. Consequently the total number of consumers that were registered for emergency access was much less than would have otherwise been expected given the general support of consumers across trials for emergency access.

The lesson learned was:

- Consumers have high expectations of the benefits of emergency access to their HealthConnect information (Strong).

7 Secondary Users Participation

7.1 Scope of Secondary Uses

7.1.1 Secondary Users

No lessons identified in this report.

7.1.2 Areas Secondary Uses will Support

Please refer to section 7.3.1.

7.1.3 Examples of Secondary Uses

Please refer to section 7.3.1.

7.2 Benefits of Secondary Uses

No lessons identified in this report.

7.3 Consent and Responsibilities

7.3.1 Consent for Secondary Uses

Secondary uses of *HealthConnect* data, other than for the evaluation purposes were not in the scope of the Field Test or trials. However in the Field Test and some of the trials consumers were specifically asked in interviews or focus groups as to their views concerning the use of their *HealthConnect* information for secondary uses such as de-identified data for research or health service planning and identified data for selecting consumers for clinical trials.

In the Field Test, it was realised that it was important to carefully consider secondary uses in the design phases otherwise secondary access may require significant reengineering or additional consents if undertaken at a later time.

The findings from the *MediConnect* Field Test was that consumers were more prepared to say that they would provide information for secondary purposes when asked in an interview than they were when asked in a survey.

HealthConnect participants in the consumer focus groups held at the end of Phase 2 of the Tasmanian trial were prepared for de-identified data to be made available for secondary uses. However, they were much more cautious about identified data being used as the means of identifying them for clinical trials. The reservations about clinical trials was because a

number of consumers attending the focus group were already involved in other clinical trials and did not want *HealthConnect* to be used to apply pressure to participate in additional trials.

In the Northern Territory, the question of secondary uses of data has not been canvassed widely until there is more substance as to the exact nature of the secondary uses. The reactions of those who have been asked so far are that they will expect consent to be sought before the data can be used for secondary uses.

The lessons learned were:

- Estimates of the percentage of consumers prepared to release their information for secondary uses range between 42% and 100%. Generally the estimates from interviews are in higher end of this range (Moderate);
- Consumers are concerned that their information will be used by other government departments (Limited);
- Some consumers in the Northern Territory were concerned that their information would be used for secondary purposes without their consent (Limited); and
- Only about 50% of consumers are prepared for their identified *HealthConnect* information to be used for selecting them to participate in other research trials (Limited).

7.3.2 Responsibilities of Secondary Users

No lessons identified in this report.

7.4 Governance of Secondary Uses

7.4.1 Governance Structure

No lessons identified in this report.

7.4.2 Secondary Uses Approval Process

No lessons identified in this report.

7.4.3 Information Access Process

No lessons identified in this report.

8 *HealthConnect* Context and Roles

8.1 Consumers

Please refer to sections 4.1.2 and 5.3.1.

8.2 Providers

Please refer to section 6.2.1.

8.2.1 Types of *HealthConnect* Provider

Please refer to section 4.1.2.

8.2.2 Provider Access to *HealthConnect*

Please refer to section 6.2.6.

8.2.3 Provider Processes

Please refer to section 10.

8.3 Secondary Users

No lessons identified in this report.

8.4 *HealthConnect* Governance

8.4.1 *HealthConnect* Governance – Functions and Processes

At the highest level, the *HealthConnect* Board governed the *HealthConnect* trials. The Board considered proposals presented by the States and Territories for the conduct of trials. Once a trial was approved by the Board, regular reporting of progress was required as part of the terms of conducting a trial.

Whilst each of the *HealthConnect* trials was a joint Commonwealth and State initiative, the *MediConnect* Field Test was a Commonwealth project jointly managed by the Department of Health and Ageing and the Health Insurance Commission in close consultation with health care providers and consumer groups.

The Field Test and the trials involved a large number of stakeholders and several different governance structures were used. In all cases, the States and Territories were responsible for the management and operation of the *HealthConnect* trials. The Field Test project sponsor had overall responsibility for the management and operation of the *MediConnect* Field Test.

The *MediConnect* Development Group was the governing body responsible for the *MediConnect* Field Test. The Development Group included a large number of stakeholders and was considered by the key stakeholders to be a good model of engagement. The size of the group brought special challenges associated with communication, managing stakeholder expectations and in decision making. It was particularly important that the boundaries between advice and decision making were clearly defined. There was a series of committees involved in the management and support of the Field Test including the Field Test Working Group and the Evaluation Working Group. Each location (Ballarat and Launceston) had a Field Test Manager and Support Team as well as a Field Test Local Advisory Group.

The Tasmanian trial had a Trial Management Committee chaired by a person independent of both the State and Commonwealth Governments but membership included representatives from the State and Commonwealth Departments as well as the Southern Tasmanian Division of General Practice and the Chief Executive Officer of the Royal Hobart Hospital and consumer representatives as members. There was also a Stakeholder Reference Group dealing with operational trial issues that included stakeholders from general practice, various departments within the hospital as well as representatives of private providers, consumers and other external stakeholder groups. Expert design groups were convened as required for specific aspects of the work. The Trial Manager was responsible to the Trial Management Committee for the day-to-day control of the project team and the operation of the *HealthConnect* trial.

The Northern Territory trial had a Governing Board comprising each participating organisation, health providers, associated communities and consumers as well as representatives of the Commonwealth and the Northern Territory governments. There is strong and active representation on the Board from the communities participating in the trial. This was considered an essential element in building support for the trial. There is a local Trial Office comprising a full time Project Manager and several Project Officers employed through contracts with local organisations in the Katherine region.

A Trial Management Committee that reported through its Chairman to the Queensland Health Project Sponsor managed the North Queensland trial. The Project Sponsor was both a member of Queensland Health's Executive and a member of the *HealthConnect* National Board. As such, the Project Sponsor was able to present the latest trial issues and findings directly to the *HealthConnect* Board.

The Queensland Health Project Director controlled the project team and was accountable to the Project Sponsor. A Queensland Health Steering Committee also advised the Project Sponsor and the Project Director was a member of this committee. In reality, the Steering Committee was only responsible for the original trial proposal. The Trial Management Committee provided the direction and high level decisions for the trial. The day-to-day running of the trial was left to the project team with the Project Director providing high level guidance.

The lessons learned were:

- There is a need for strong local level governance (Moderate);
- The active involvement of local stakeholders such as the Divisions of General Practice is crucial (Moderate);
- The Governance Board in the NT has been crucial in fostering support within indigenous communities (Moderate);
- Providers were generally more receptive to participation where the Field Test was endorsed by local representatives of stakeholder organisations (Strong);
- The roles of funder and stakeholder need to be separated in the governance structure (Moderate);
- A product supplier / user group is required for collaboration between the two groups (Limited); and
- Early vendor engagement is required because the timelines to test and deliver *HealthConnect* functionality is lengthy and varies between vendors (Strong).

8.5 HealthConnect EHR Repository

8.5.1 The Federated Model for HealthConnect Delivery

No lessons identified in this report.

8.5.2 HealthConnect Records System

The *HealthConnect* Records System (HRS) used in the Field Test and trials received information in a variety of forms including:

- HL7 messages from providers that were then structured and held as event summaries in the HRS (Tasmania, North Queensland, and Field Test);
- Web browsers were used to allow users to enter information in templates that then were stored as event summaries (Tasmania, and North Queensland) ; and

- In the Northern Territory, .pdf files were sent to the HRS using HL7 messaging. The repository saves to the Firebird open source database as a collection of .pdf files.

The North Queensland trial investigated the size of messages being sent to and from the repository as well as the size of event summaries. The message size to GPs were 1Kb for notifications and between 7 to 8Kb for discharge summaries except where a care plan was included in which case the size was 15Kb. The message size for an equivalent .pdf file was 70Kb. The message sizes from GPs were; 1 to 5Kb for the Initial Health Profile, 1 to 3 Kb for the GP update and 1 to 4 Kb for Pathology results. The average size of event summaries ranged from 19Kb for a discharge summary to 0.4 Kb for surgery event notifications and radiology reports.

The lessons learned were:

- Many of the issues raised in the analysis of repository data in the Northern Territory trial stem from the fact the data is stored as text based documents rather than individual data elements that are properly defined and have clinical meaning. Clearly, the more defined and granular the data within *HealthConnect*, the greater the potential for use in a meaningful way by *HealthConnect*, by provider clinical information systems and for secondary uses (Limited);
- However, Tasmanian trial providers have expressed concern about the level of data granularity required for *HealthConnect* and suggests alternative strategies that reflect individual provider priorities (Limited);
- The size of event summaries is of great importance as it greatly influences the estimates of future storage requirements as well as the downloading time to local systems (Limited); and
- The database product selected for the local *HealthConnect* repository should ideally be one of the nationally preferred databases (Limited).

8.5.3 Approved EHR Manager

No lessons identified in this report.

8.5.4 Health Records System / Approved EHR Manager – Processes

Please refer to section 9.13.

8.6 National Data Store

No lessons identified in this report.

8.7 HealthConnect Metadata Repository

Please refer to section 8.15.4.

8.8 Consumer Registration and Management

Please refer to sections 5.3.1 and 5.3.2.

8.9 HealthConnect Consumer Index

Please refer to section 5.3.1.

8.10 HealthConnect Consumer Access Service

Please refer to section 5.4.2.

8.11 Provider Registration and Management

Please refer to sections 6.2.1 and 6.2.7.

8.12 Provider eHealth Access Services

Please refer to section 8.15.4.

8.13 eHealth Message Bank Service

Please refer to section 8.15.4.

8.14 Value Added eHealth Services

Consumers can benefit from the use of *HealthConnect* information to remind them of screening and other complications testing. In the Tasmanian trial, consumer focus groups explored the current processes that consumers and providers used to ensure that their various tests were undertaken according to best practice guidelines as well as the opportunity to assist consumer compliance through better use of the *HealthConnect* record.

In Phase 2 of the Tasmanian trial, reminders were automatically sent to providers based upon the best practice guidelines for complication screening of consumers with diabetes. The rules for generating reminders included both advice and guidance in areas such as new referrals and reminders for overdue complication screening tests and checks. The review dates for some tests and checks were based upon fixed review periods, whilst others were

variable and were calculated based upon information recorded by providers within event summaries and were therefore specific to the consumer's clinical situation.

In the Tasmanian trial, a function was available to download certain information from *HealthConnect* for inclusion into the GP's local clinical information system. Towards the end of the trial this function was being used more often.

Tasmanian consumers using *HealthConnect* also had a direct link to *HealthInsite* and Diabetes Australia as part of the services available on the *HealthConnect* web site but very few consumers had used the service. Consumers were looking for endorsed reference sites that would give them more detail on the management of their condition as well as current research into diabetes.

The lessons learned were:

- About two thirds of consumers believed they were responsible for ensuring that the management of their personal health care was up-to-date. The remaining one third believed that it their joint responsibility with their provider. Just under half of the consumers use self reminders such as a calendar to remind them when tests or checks are due. About a third of consumers thought *HealthConnect* should remind consumers and providers about due or overdue health checks (Moderate);
- The use of decision support facilities in *HealthConnect* such as reminders was only introduced late in the Tasmanian trial. While there is little provider experience in their use of these reminders, about a third of providers thought reminders would be a useful addition to *HealthConnect*. Some providers had already installed recall systems as part of their local clinical information system and therefore did not require the reminder functionality (Limited); and
- Consumers in Tasmania also saw the value of links to endorsed reference sites that would give them more information about their condition and the current research into diabetes (Limited).

8.15 National Health Infostructure

8.15.1 National Health Identifier

Please refer to section 5.3.1.

8.15.2 National Health Provider Directory

No lessons identified in this report.

8.15.3 National Health Metadata Repositories

Please refer to section 8.15.4.

8.15.4 Health Information Standards, Terminologies and Data Sets

Messaging Standards

The Field Test and a number of trials in structuring the messages between the provider information systems and the *HealthConnect* repository used HL7 standards. However, apart from HL7 pathology messaging, there is not a handbook available that prescribes unequivocally how the standards should be implemented in practice. This leads to variations in implementations that protract the implementation and testing timeframes.

Both the Tasmanian trial and North Queensland trial used HL7 2.3.1 for messaging between the GP systems and the *HealthConnect* repository. The Initial Health Profile and GP event summaries in North Queensland aligned with the draft referral and discharge summary (AS 4700.6-2004) and the pathology message standard was used for pathology results.

Code-sets & Terminologies

Data integration and Electronic Decision Support (EDS) cannot work unless standard code sets are used consistently or where there are known mappings between codes sets. For example the Tasmanian trial used A-Z Dex for medicines across all settings, enabling medicines information from GP and Hospital settings to be integrated within the *HealthConnect* record. Again, in the Tasmanian trial, pathology results from both the public and private pathology laboratories were linked by mapping their otherwise different pathology code sets to a common code set (LOINC).

The various code sets used in the Field Test and trials are now described.

The Tasmanian trial used A-Z Dex for medicines for both GP (in Medical Director) and hospital prescribing. A standard for the messaging of the dosage, strength and instructions associated with medicines was still a problem between the GP's clinical information system and the *HealthConnect* repository. The GPs in the North Queensland trial used MIMS in Spectrum and A-Z Dex in Medical Director for medicines. Queensland Health used its own state-wide (generic) formulary in the Townsville Hospital that was part of the North Queensland trial.

LOINC codes were used to match pathology tests performed at Hobart Pathology (private) and the Royal Hobart Hospital's pathology department. This task required both groups to categorise each of their tests against the LOINC definitions. Medical Director also used LOINC codes in the North Queensland trial.

Medical Director used DOCLE for diagnoses and clinical terminologies in both the Tasmanian and North Queensland trials. Spectrum Plexus used ICPC2 Plus as the clinical code set in North Queensland. Queensland Health had no agreed clinical codes sets for use at the point of care in the Townsville Hospital.

Allergies and alerts were entered as free text in various clinical information systems and the absence of codes made cross relating of alert data difficult resulting in data duplication within the HealthConnect record.

The trials did not use the Australian Standard for health care provider identification because there were relatively few external providers. The standard for client identification was not used because clients were sourced from an existing patient administrative system (for example, HBCIS in North Queensland and EDIS in Tasmania) that had its own client identification information and processes already defined. The Field Test used the Medicare number for consumer identification.

Standard terminologies are essential for successful implementations of HealthConnect. Specifically, terminologies are required for:

- Medicines;
- Pathology tests and results;
- Diagnoses;
- Allergies; and
- Alerts.

Standardised HealthConnect Data Structures

The North Queensland trial has identified the following items as needing standards and assisted the national clinical information project (CIP) in defining standards for the first three items:

- Event summaries;
- EHR views and managed lists;
- National Discharge summary; and
- EHR record architecture.

The EHR Architecture

The EHR architecture is being addressed internationally but locally the Brisbane Southside trial will be trialling the use of a standards based EHR record architecture, openEHR.

The lessons learned were:

- There is an urgent need for practical interface standards and formal metadata defining event summaries, EHR views, EHR lists and associated processing rules (Moderate);
- The use of common code sets is essential for medicines, problems, diagnoses, pathology and alerts. The use of free text adds to complexity rather than simplifying the situation (Strong);

- Local implementations of *HealthConnect* should conform closely to national specifications and standards in order to avoid long term development overheads and incompatibility with national *HealthConnect* components (Moderate);
- The end-to-end flow of information to the *HealthConnect* repository and back needs to be based on standards agreed for all implementations (Strong);
- The issue of lack of HL7 experience is an industry wide issue rather than specific to the trials' software vendors (Strong) requiring a high degree of vendor engagement and commitment to implementing *HealthConnect* standards;
- An assessment of what is required to bring leading health software applications up to the latest HL7 standard is required if implementations are not to be caught up in technical issues (Limited);
- *MediConnect* vendors believe that local data integration with the repository and drug to drug checking functionality can only be introduced once a nationally consistent code set for medicines was developed (Limited); and
- Inconsistent Medicare numbers and date of birth were the most common errors in message rejections by *MediConnect* (Moderate) highlighting the importance of a quality consumer registration system supporting a national consumer health identifier.

8.16 Supporting ICT Infrastructure

The Field Test and all of the trials have largely tried to operate within the limitations of existing information systems whether they were in GP practices, hospitals or in private health care providers. The majority of the funds associated with trials have gone into the costs of the project team, the software and hardware required for the repository and messaging between providers and the repository and the evaluations. Some funds were spent on ensuring providers had broadband access where this was needed for trial participation. Very little funding was provided to increase the numbers of computers available at provider locations in order to use *HealthConnect*.

Without exception, providers in participating hospitals have had difficulty in obtaining access to view *HealthConnect* and create event summaries. Outpatient clinic lists were rearranged so that *HealthConnect* consumers could see providers in a room with *HealthConnect* access. Doctors wanting to prepare discharge summaries have found it difficult to get uninterrupted access to a computer for the required time to review the clinical notes and prepare the discharge summary.

The lessons learned were:

- Inadequate deployment of clinical information systems and infrastructure and an over-dependence on technically obsolescent information systems (and an inadequate understanding of these systems) has impacted most trials and impeded evaluation in many areas (Strong);
- Pre-existing infrastructure will impact the technical feasibility of *HealthConnect* unless addressed as a priority within initial implementations (Strong);
- Provider viewing of *HealthConnect* has been impacted by poor response times even using broadband connections. Viewing performance must be considered a ‘show stopper’ for *HealthConnect* unless addressed through performance optimized solutions and alternative *HealthConnect* deployment strategies (Strong);
- Connectivity is a critical success factor for *HealthConnect* not only in terms of telecommunications links but also feeder systems and network and server availability (Strong);
- Technical projects are particularly vulnerable in rural and remote areas – areas where *HealthConnect* may offer the greatest benefits (Limited); and
- Prospective software applications need to be assessed in the context that they will be used across the public telecommunications infrastructure (Strong).

9 Information Components

9.1 Introduction

Please refer to sections 9.6, 9.7, 9.8, 9.13 and 9.14.

9.2 HealthConnect EHR Repository

Please refer to section 8.5.2.

9.3 HealthConnect Electronic Health Record

Please refer to section 4.2.1.

9.4 The CEN EHR Reference Information Model

No lessons identified in this report.

9.5 HealthConnect National Data Store

No lessons identified in this report.

9.6 HealthConnect Event Summary

The event summary is the primary mechanism for adding information to the *HealthConnect* repository. The Field Test and trials used a number of formats to structure the content arising from the consumer / provider consultations and inpatient stays etc.

In all but the Northern Territory trial where .pdf files were used, the content of *HealthConnect* comprised separate data elements that were generally structured in some form of event summary template. Providers in the Tasmanian trial felt that more work needs to be done on the summary data set because the level of detail created for the trial of diabetes management would make it impossible to manage when extended over all conditions.

GPs in Tasmania also pointed out that there were relatively few conditions (for example, diabetes and ante-natal care) that could be managed with a limited number of quantitative measures and that it was important to be careful in generalising the results of the Tasmanian trial because the trial centred primarily on diabetes management.

Certain types of data such as the current medicines need to be maintained easily and processes need to be established that ensure the contributions from the range of prescribers are recorded on *HealthConnect* and also communicated to the primary health care provider,

generally the GP, for inclusion on their local clinical information system. The *MediConnect* Field Test demonstrated that it is necessary to additionally separate out the current medicines from within consumer medicines history (but not exclude them) because it is too easy to miss a medicine if one tries to search through a list for those that are current.

The Clinical Information Program (CIP) is defining a standard set of event summaries for use in the implementation of *HealthConnect* based upon a range of consultations including the experiences of the Field Test and trials.

The lessons learned were:

- The concept of summary information was appealing to hospital providers in preference to what was perceived as a cumbersome lengthy paper based records (Limited);
- In contrast, GPs do not think event summaries are sufficiently detailed currently to replace discharge summaries or clinic attendance letters (Limited);
- Some GPs feel that further work is required on the summary data set as the current granularity of information required to complete the GP event summary would make it impossible to manage on a national scale (Limited);
- There is some concern amongst GPs that the findings of a trial based on a fairly discrete condition such as diabetes might be used inappropriately in extrapolating what is required for a national *HealthConnect* solution for all medical conditions (Moderate); and
- *HealthConnect* needs a data set that better reflects the requirements of Emergency Medicine (Limited).

9.7 EHR Views

Viewing is probably the single most important function of *HealthConnect*. Viewing requires the capability to present the right information, in an easily comprehensible form, in a very short space of time. It further requires the ability to analyse information further (drill down) or to quickly present a graphical view of the information over time. These tasks all have to be completed in the context of an ever-growing repository of summary information being viewed during consultations.

None of the trials or the Field Test reached a situation where the size of the database making-up the *HealthConnect* repository affected *HealthConnect* performance. However, a number of the more complex views in the Tasmanian trial did take additional time to display, possibly due to the structure of the underlying *HealthConnect* repository and the need to bring together the information required for these views.

It is interesting to compare the approaches of the Tasmanian trial with the North Queensland trial in terms of the presentation of *HealthConnect* information as views. The North

Queensland trial had one all encompassing view with filters to limit either the time range or nature of information in addition to being able to display single event summaries. The Tasmania trial on the other hand had a suite of views some of which were composite views, some contained graphical representations and others single event summaries. No specific evaluation has been undertaken by trials to identify which approach is preferred by providers.

Only in the Tasmanian trial were consumers given the capability to view their *HealthConnect* record directly using a web-browser. A number of consumers felt that the web site was difficult to navigate and most wished that the medicines instructions were in plain English not in the shorthand used by prescribers. Even so most consumers saw value in accessing *HealthConnect* directly and about 30% of the trial participants wanted to be trained to use *HealthConnect*.

In the Northern Territory trial, the single view of the information (that is, the presentation of the individual event summaries) makes it difficult to conclude what is the most valuable information. In the Field Test, the use of *MediConnect* functionality was perceived as impacting consulting and dispensing time and this has again limited the available experience of viewing the *MediConnect* information.

The lessons learned were:

- The critical view is regarded as a much quicker way of reviewing medical information than reviewing the paper record (Limited);
- The most frequently used views after the default view (where there was no choice in terms of viewing) were the single pathology result and single event summary (Moderate);
- Community pharmacists have suggested that a view tailored to their needs would be more useful than searching through the complete *HealthConnect* record (Moderate);
- The capability to define other views as the default provider view could improve performance and would better reflect provider's preferences (Limited); and
- The design of *HealthConnect* needs to carefully balance the potential benefits of composite views against the performance implications of such views (Limited).

9.8 EHR Lists

A consumer's medication regime generally changes on entry to hospital and after the course of hospital discharge medicines are completed. Hospital doctors need to know what medicines patients are on when they are admitted and GPs need to know what medicines consumers are on when they are discharged.

The North Queensland trial demonstrated this process with information from the GP keeping the hospital informed of the current medicines whilst the consumer was waiting to be admitted for surgery and the hospital informing the GP on discharge after the surgery.

In the Tasmanian trial, there was little evidence of hospital doctors seeking the current medications from *HealthConnect* on admission to hospital or presentation at the Emergency Department. In Phase 2, there were technical problems regarding the revision of the discharge summary medications to reflect the amendments made in pharmacy to the discharge summary medications and these changes were then not reflected in the final discharge event summary lodged with *HealthConnect*.

In the *MediConnect* Field Test, one hospital printed out the consumer medicines history on admission and used this information to determine the consumer's current medicines rather than ring up a GP or contact the consumer's family. Hospitals in the Field Test did not have access to *MediConnect* adapted clinical software to create event summaries and therefore could not update the consumer's medicines history.

The lesson learned was:

- The sharing of medicines information between hospital doctors and those responsible for ongoing care (generally a GP) needs to include the current medicines at admission and any amendments made by the hospital pharmacy to the hospital discharge medicines (Moderate).

9.9 EHR Query / Response

Please refer to section 4.2.3.

9.10 HealthConnect Notifications

Please refer to section 6.4.5.

9.11 Consumer Details

Please refer to section 5.3.1.

9.12 Access Control List

Please refer to section 5.2.3.

9.13 EHR Access Logs and Audit Trails

The evaluators of the trials and Field Test extensively used the EHR access logs to examine the viewing behaviour of *HealthConnect* participants (providers and consumers). The logs gave the precise date and time of viewing, type of view used as well as details of the person viewing and the consumer whose record was viewed.

The consumers participating in trials rarely ever asked to see who had viewed their *HealthConnect* record and even in the Tasmanian trial where consumers with direct access could obtain this information themselves online, the facility was rarely used. In the Field Test, the existence of the audit trail was discussed with consumers who all thought it an important feature even though no one requested access to the information.

The lessons learned were:

- Although few consumers had requested their audit log, all consumers thought that an audit log was an important aspect of ensuring probity of access (Limited).

9.14 HealthConnect Reports

None of the trials reported much use of the facility that allowed consumers to obtain a hard copy print out of their *HealthConnect* record. At the end of Phase 2 of the Tasmanian trial, consumers were asked whether they wanted a printed copy of their *HealthConnect* record. For many this was the first time they had seen their record, though some providers in the Tasmanian trial were showing consumers views of their record during the consultation.

In the *MediConnect* Field Test, consumers' preferences regarding the format of reports were explored. The general finding was that there would need to be a number of formats to satisfy the range of consumer requirements.

The lessons learned were:

- When shown various versions of the Consumer Medication History it was clear that one size will not fit all and a basic generic format as well as number of different formats will be required (Limited); and
- If consumers are using reports for themselves, *HealthConnect* will have to display information in full, as medical shorthand was meaningless to most consumers (Moderate).

9.15 HealthConnect Consumers and Providers

9.15.1 HealthConnect Consumer Index

Please refer to section 5.3.1.

9.15.2 HealthConnect Provider Directory

No lessons identified in this report.

9.16 HealthConnect Metadata

Please refer to section 8.15.4.

9.17 HealthConnect Registration Objects

Please refer to section 9.13.

9.18 National Information Repositories

No lessons identified in this report.

9.19 eHealth Communication Messages

Please refer to section 8.5.2.

10 HealthConnect Business Processes

10.1 General Findings

For most providers, involvement with HealthConnect did involve additional time but because of the low numbers of participating consumers presenting at consultations this factor did not significantly impact patient throughput. No provider group found it necessary to change their work practices significantly on account of participating in the Field Test and trials although some providers modified their workflow when seeing HealthConnect patients to minimise the impact of response time delays when retrieving information from HealthConnect.

GPs and community pharmacists were the two groups that were already routinely using computers as part of their normal business processes and had computers available at the point of care. Hospitals and other private providers generally did not have computers available at the point of care and had to make arrangements to use HealthConnect at other times when the consumer was no longer present.

Providers generally did not see enough participating consumers to become really proficient in the use of HealthConnect or MediConnect. Where HealthConnect was integrated with clinical information systems such as for GPs in Tasmania for event summary creation and North Queensland for event summary creation and receipt of surgery event notifications, the additional time required to use HealthConnect was very small due to the extent to which event summary creation was embedded within provider clinical systems.

Hospital doctors in the North Queensland trial found the pre-populated discharge summaries much easier to prepare than by their usual method and were seeking to have the facility extended for use with all patients, not just trial participants.

In the Northern Territory trial, providers reported that the work practice changes associated with HealthConnect seemed to take little regard of the demands on their time, particularly when working in remote areas. This is being addressed through the workplace reforms now being undertaken in the North Territory.

The lessons learned were:

- Sufficient numbers of participating consumers are required if either MediConnect or HealthConnect is to be integrated into provider workflow (Strong);
- Event summary creation must produce quality information that will be valued by other providers (Strong);
- There is a need to focus on viewing as the clinical value lies in the viewing rather than the completion of an event summary (Strong);

- The work practice changes envisaged in the design of *HealthConnect* seemed to take little account of the time demands of providers particularly in remote areas (Limited);
- Some providers re-adjusted their use of time to compensate for the delays in messaging (Limited);
- All primary care providers currently believe that *HealthConnect* adds time to a consultation but suggest that if it is well designed and implemented it could save time (Strong); and
- Primary care providers work practices are highly variable which has important implications on interoperability with *HealthConnect* because it will be difficult to generalise the variety of work practices (Moderate).

10.2 Hospitals

Hospitals were involved in the Field Test and the trials, although in the Field Test the hospitals had viewing access only and could not add information to *MediConnect*.

In the Northern Territory trial, the Katherine hospital used the Jade Care Clinical system to prepare discharge summaries for *HealthConnect* participants that were inpatients. The emergency department and outpatient clinics in the hospital did not participate. Part of the issue with the creation of event summaries was the need for doctors and nurses to become proficient with the Jade Care Clinical system as well as establishing the business rules for sending discharge summaries to the *HealthConnect* repository.

In North Queensland, The Townsville Hospital was central to the trial. The trial centred on the departments performing elective surgery. Registered Townsville Hospital providers had full access to *HealthConnect* information related to their patients. The *HealthConnect* repository was interfaced with the Patient Administration System (HBCIS), the Pathology system (Auslab), the Radiology system (RIS) and the Operating Room system (ORMIS).

In Tasmania, the Emergency Department, the Endocrinology Department, Diabetes Education, Podiatry, the Eye Clinic, Ophthalmology, Pathology, Radiology and all doctors treating *HealthConnect* consumers as inpatients participated in the trial. A project officer located in the hospital supported the providers (mainly doctors) in the preparation of event summaries. This person also assisted with the identification of participating consumers. For an inpatient, doctors in the participating hospital generally did not view *HealthConnect* around the time of admission. Most of the viewing was associated with the preparation of discharge summaries.

Diabetes educators in the Tasmanian trial mostly prepared their letters to GPs using the *HealthConnect* template. A copy of the printed version was stored in the medical record for internal hospital use whilst the original was sent to the GP. Only one endocrinologist prepared all his clinic letters for *HealthConnect* participants using printed copies of the event summaries. The diabetes educators and the endocrinologist did view *HealthConnect* often around the time of the appointment with the consumer and on occasions showed the information to the consumer as part of the consultation. The hospital podiatrists prepared all

their event summaries without the assistance of the project officer but this task was done after the consultation.

In the *MediConnect* Field Test, two hospitals participated. The hospital that routinely on admission included a copy of the consumer medicines history in the consumer's notes attached much greater value to the information than did the hospital that relied on doctors requesting the information. In the latter hospital, it was only the hospital pharmacist that ever retrieved any information or printed a report from *MediConnect*, even though the availability of *MediConnect* facilities and consumer consent arrangements were the same in both hospitals.

Change management strategies will need to be employed to assist hospitals in moving towards the preparation of electronic discharge summaries and clinic letters as a prerequisite for participation in *HealthConnect*.

Emergency Department

Although the Tasmanian trial included participation by the Emergency Department, very little evaluation feedback is available. At the Royal Hobart Hospital, emergency department participation was largely passive with hospital based Trial Office staff completing the majority of event summaries on their behalf. The Emergency Department staff rarely viewed *HealthConnect* (despite *HealthConnect* performance being acceptable to hospital providers).

Early Phase 1 Tasmanian evaluation findings suggested that one of the reasons for this lack of participation by emergency department personnel might have been the nature of emergency care – including the need to focus on the presenting problem rather than the co-morbidities (such as diabetes) - at least initially, and the time pressures under which emergency care is often provided. From the outset of the Tasmanian trial, emergency department staff had suggested that information on other clinical groups such as consumers with cardiovascular disease or chronic airways disease might be more appropriate in testing *HealthConnect* within the emergency context, although this was not within the scope of the Tasmanian trial.

As detailed above, in the *MediConnect* Field Test only one hospital made effective use of the consumer medicines history. Even in that instance, the dedicated computer provided for the task was located in an adjacent room requiring admission staff to access a different computer mid way through the admission.

Consumers have high expectations regarding the benefits of emergency department access and use of *HealthConnect*. GPs also cite the potential to improve information coming from emergency departments about their patient presentations. However, the lack of any real emergency department evaluation materials upon which to base national implementation planning creates a dichotomy for *HealthConnect* currently, given the importance of emergency department participation in the minds of consumers and the potential to provide GPs with important benefits.

If lead implementations are including emergency departments within the scope of their implementation planning, considerable consultation with local emergency departments will be required in order to establish how *HealthConnect* could be made useful to emergency

departments in a way that encourages uptake and use of *HealthConnect* and the embedding of *HealthConnect* concepts within emergency department workflow.

The lessons learned were:

- The importance of obtaining the support of senior management if *HealthConnect* is to make inroads into the large organisations such as public hospitals (Limited);
- Hospital clinician engagement, particularly the hospital specialists is vital (Strong);
- Interns and residents are key targets in terms of changing workflow but are a challenge to support due to rotations and roster changes (Limited);
- The challenges of obtaining timely discharge summaries from hospitals should not be underestimated (Strong);
- *HealthConnect* has to be easy to use as poor IT skills remain an issue for many providers (Strong);
- Lack of access to sufficient numbers of conveniently located computers is a key issue for hospitals as well as their location (Strong);
- There is a need for change management of the existing work processes to take advantage of the benefits of *HealthConnect* (Strong), particularly in terms of viewing *HealthConnect* during the consultation, on admission, on attendance at emergency and during the anesthetic assessment (Limited);
- Emergency Department staff have indicated that other clinical groups such cardiovascular disease or chronic airways disease might be more appropriate for testing the value to Emergency Department (Moderate); and
- If implementations are including emergency department in the scope of their implementation planning then considerable consultation is required in order to establish how *HealthConnect* could be made useful and included in the emergency department workflow (Strong).

10.3 General Practice and Primary Health Care Workers

General practitioners were involved in the Field Test and the trials, although in the Northern Territory, Aboriginal Health Workers also play a crucial role in primary health care.

In the North Queensland trial and Tasmania the production of event summaries was integrated into the GP's clinical information system (Medical Director and Spectrum - Plexus). This process was a good business fit and GPs could readily create event summaries. These examples indicate what needs to be achieved in interoperability with *HealthConnect* as far as creating events.

In North Queensland, GPs could not directly view the *HealthConnect* repository. Instead messages comprising surgical event notifications and discharge summaries were sent to GPs during the waiting period for surgery and after surgery had occurred. These messages were incorporated into the GP's clinical system and were viewed within that system. The feedback from GPs was that the surgical event information represented valuable new information for the GP as well as the discharge summary being received more reliably.

In Tasmania, GPs could view the *HealthConnect* repository through a variety of views. They often found that the information in *HealthConnect* was largely their own. Also the time taken for views to appear on the screen was significant in the scale of the time of the consultation and this tended to diminish the use of *HealthConnect* for viewing. Even when consumers were admitted to hospital, GPs tended to wait for the paper based discharge summary rather than view *HealthConnect* for the hospital discharge event summary. The trial acted as a catalyst for the improvement in these routine information flows. Analysis of the *HealthConnect* logs from Tasmania revealed that in approximately 11% of consultations do GPs view *HealthConnect* at or near to the time of the consultations. Data from the latter part of the trial suggests that 40% of the time that GPs view *HealthConnect* for any reason it is at or around the time of the consultation with the consumer.

In the Northern Territory trial, there were many more primary health care workers involved in community health centres than GPs. There was still a need for many of the primary care workers to become more proficient and more consistent in the use of their clinical information system as part of their normal work before they could effectively participate in *HealthConnect* both in creating event summaries and viewing event summaries created at other community health centres. Much of this is being addressed in workplace reforms taking place in the Aboriginal Health Services. The use of clinical systems at the point of care not only has benefits in direct patient care it also has benefits in terms of health promotion opportunities and in maintaining records of services delivered.

Lessons learned were:

- The generation of event summaries can be integrated into the workflow of GPs and primary care workers and this is an essential requirement for *HealthConnect* (Strong);
- The greater use of practice nurses and practice managers need to be explored in refining GP practice workflow to accommodate *HealthConnect* (Moderate);
- The viewing of *HealthConnect* may not occur at every consultation (Moderate);
- Provider viewing behaviour depends upon a range of factors including the perceived value of the information contained in *HealthConnect*, when it is clinically appropriate to seek the information, how it is presented, and the performance of *HealthConnect* in retrieving the information (Moderate);
- Access to *HealthConnect* is an important element in the integration of the use of *HealthConnect* with the provider workflow (Strong);

- *HealthConnect* has the potential to simplify the incorporation of other provider's reports when practices move totally to electronic records (Limited); and
- Low numbers of trial participants meant that the use of *HealthConnect* never became a routine activity of providers (Strong).

10.4 Community Pharmacists

Dispensing is a time critical process. It is essential that this process works smoothly every time that it is performed. In the Field Test and the Tasmanian trial there were consistent problems with scanners in reading the bar-coded prescriptions for many reasons particularly, the printers used for creating the bar codes. This meant that the efficiency savings inherent in the downloading of prescription information (rather than re-keying scripts) and information on new consumers were not demonstrated by the Field Test and the Tasmanian trial. These problems also led to the dispensed medicines not being linked to prescribed medicines because pharmacists often did not type in the medication form reference (MFR) numbers if they could not be scanned.

The way the communications systems were configured for the 'store and forward' messaging process in the Tasmanian trial meant that there could be delays of up to twenty minutes between the electronic prescription leaving the GP's systems and arriving at *HealthConnect*. This meant that often the electronic prescription was not available when the consumer arrived at the pharmacy. The delay in retrieving the electronic version of the prescription or its unavailability led to the electronic prescription being used in 1% of instances (Tasmanian trial). This situation should be overcome in any implementation as the messaging configuration described above was specific to this trial. This experience however, highlights the need to understand the impact of system design and implementation on business processes.

The additional information stored on *MediConnect* and *HealthConnect* such as allergy, diagnosis and pathology results should be of great use to community pharmacists. In particular, for new consumers at a pharmacy this information could simplify the collection of the consumer's clinical details in the pharmacist's local system. This is less of a need where the pharmacist already knows the consumer that was the case for most of the consumers in the Tasmanian trial.

In the Northern Territory trial, the ability to identify *HealthConnect* consumers is a major benefit to community pharmacists in ensuring that correct medicines are dispensed.

Very little was learned in the trials and Field Test about the incorporation of over the counter (OTC) medicines into *HealthConnect* although it was identified that this information would need to be able recorded at the point-of-sale counter where the goods are purchased (rather than by the pharmacist in the dispensary).

Notwithstanding the technical problems, the pharmacists could see the real value in being able to access information from *HealthConnect*. This task might require a specific view to

be developed for pharmacists that would present all they required in a single screen. It was clear from the Field Test and the Tasmanian trial that the time pressures of dispensing would not allow them to go searching for information in *HealthConnect*.

Lessons learned were:

- Pharmacies with high workloads found that *MediConnect* was an impediment to workflow and the functionality was simply not used, and opportunities for forward dispensing need to be explored (Moderate);
- Bar coding processes need to work first time every time to be used. The Field Test and Tasmanian trial both experienced problems with the bar coded prescriptions from printers other than laser printers (Moderate);
- The bar coded prescriptions at least identified the consumer as participants in *HealthConnect* (Moderate);
- Not using the medication form reference (MFR) and medication identification reference (MIR) leads to the loss of the efficiency gains associated with dispensing using downloaded prescription information. The absence of the MFR and MIR(s) also means that dispensed medicines are not linked to prescribed medicines (Strong);
- Most participating community pharmacies believe that *HealthConnect* could be an extremely useful facility if it was well designed and tested before implementation (Moderate);
- Information for pharmacists should be presented in screen(s) tailored for their requirements in the creation of a new consumer record on their local clinical system and for information about existing clients (Limited); and
- *HealthConnect* information raises the potential of challenging the traditional role of prescribing and dispensing. This is a matter for the respective professional bodies to resolve (Limited).

10.5 Allied Health Providers

For allied health providers, access to computers at the point of care was the biggest issue in the trials. In the absence of suitably located equipment, much of the information has to be entered twice, once in the manual records and once for *HealthConnect*. Whilst this can be tolerated for a trial with low numbers of consumers participating this cannot be sustained in initial implementations. The double handling of information also leads to delays and hence the timeliness of information is affected.

The information from *HealthConnect* was found to be very valuable although some providers reported that they would like to see the clinical interpretation of the events by GPs or specialists rather than being presented the clinical information in its raw form.

The lessons learned were:

- For private optometrists with access to their own clinical information system, access to *HealthConnect* represented a good business fit (Limited); and
- For podiatrists, *HealthConnect* was a poor business fit primarily due to a lack of a clinical system to support the work of this professional group (Limited).

11 Technology Components

Technology components are addressed within a number of other sections of this report. Please refer to sections 6.3.2, 8.5.2 and 12.2 1.

12 HealthConnect Implementations

12.1 Business Strategy and Organisational Matters

12.1.1 Legal and Legislative Issues

No lessons identified in this report.

12.1.2 Governance

Please refer to section 8.4.

12.1.3 Financing Options

No lessons identified in this report.

12.1.4 Definition of Business Model

Please refer to section 10.

12.1.5 Vendor Selection(s)

The nature of HealthConnect means that a large number of software vendors are involved in implementing HealthConnect. These vendors have included the following in one or more of the trials:

- Clinical information system providers for GPs, primary health care workers and community pharmacists. Vendors involved with trials and the Field Test include Medical Director (HCN), Plexus (Spectrum), Locum3 (Global Health), Ferret (Pen Computer Systems), Communicare (Medisys), Rex (Phoenix), and WiniFRED (Nu Systems);
- Software providers for hospital systems (for example, emergency department (EDIS), patient administration systems (HBCIS), discharge summary system (Concerto and Harmony, Jade Care Clinical), clinics system (Jade Care Clinical), operating theatre (ORMIS), radiology (RADOS), pathology (Kestral) and hospital pharmacy);
- Software providers to external health care service providers (in particular, radiology and pathology);
- Software providers for the HealthConnect repository and its database product (for example, Orion). Note: two trials developed their own repository;
- Network and ISP providers (for example, ADSL service providers and Telstra satellite link);

- Messaging service providers (for example, ArgusConnect and HealthLink); and
- Certification Authorities (for example, HeSA).

The lessons learned were:

- Effective engagement of implementation teams with the vendors of CIS applications is required to support the development of *HealthConnect* solutions (Strong);
- Software vendors have indicated the timetable for the trials was unreasonable. Implementations need to set realistic timeframes for engaging software vendors (Strong);
- The need to raise the bar amongst software vendors in terms of complying with messaging standards and achieving consistent interpretation of standards. There is a need for the accreditation of software and use market forces to push developments (Strong);
- The *HealthConnect* repository needs careful consideration because there are no commercial products on the market and it is highly likely that the repository will need to be custom developed (Strong); and
- Hospitals that are not considering full clinical information systems will at least need a system to create discharge summaries electronically for creating *HealthConnect* event summaries and also have the capability to view *HealthConnect* (Strong).

12.1.6 Funds, Resources and Capability to Deliver *HealthConnect* Responsibilities

Many GP practices and community pharmacies in the Field Test and the trials did not have broadband facilities nor were they set up for secure electronic communications using PKI technologies. The costs associated with setting up these services were generally borne by the trials and provided to the health care providers to support their participation in the trials.

Providers particularly GPs, have identified that the time required to prepare information for the initial health profile and ensure that the data quality in their clinical systems are at a level that it can be used with *HealthConnect* needs to be factored into the costs of establishing *HealthConnect*. Likewise, if consultations continue to prove to take longer using *HealthConnect* (either at the time of consultation or at another time) even with performance enhancements as part of the implementation then providers will be expecting remuneration for lost income.

MediConnect Field Test vendor payments were structured to take into account the software development costs as well as the cost of providing support to different numbers in their client base. Some vendors argued that the cost of development to incorporate *HealthConnect* functionality was independent of the number of sites in the Field Test and those with only a few sites felt penalised. In the implementation of *HealthConnect*, funders will need to

review the payment formulae for the incorporation of *HealthConnect* functionality into clinical information systems.

The lessons learned were:

- The cost of preparing GP practices and pharmacies for participation was significant as well as the cost of using existing software more fully (Strong);
- There is a real cost with establishing quality data in the IHP and bringing local clinical systems up to a standard at which they can communicate with *HealthConnect* (Moderate);
- Providers will expect remuneration for lost income if consultations using *HealthConnect* take longer (Moderate); and
- There was a perceived inequity in the funding of software vendors in the *MediConnect* Field Test (Limited).

12.1.7 Engagement with Peak Consumer and Provider Bodies

Please refer to section 12.6.

12.1.8 Adoption of Business Framework

Please refer to section 10.

12.1.9 Assimilation of Lessons Learned from *HealthConnect* Trials and Early Implementations

Trial Managers met in October 2004 and these are some of the particular lessons learned compiled from that meeting:

- Need to document all discussions with software vendors (Moderate);
- Contract development is a time consuming process and a potential source of delay but it must be done properly (Moderate);
- User acceptance testing is an important part of acceptance of software products (Strong);
- It is vital to test *HealthConnect* components in a replicated live environment with dummy data before rollout (Strong);

- Participants (particularly private providers) should not load new versions of their CIS before the systems have been appropriately tested and approved. Regression testing is an important part of user acceptance testing (Strong);
- A single point of entry to support services is required. Because of the large number of vendors participating in *HealthConnect* solutions, users need a single point of contact for all problem identification, rectification and support issues. (Moderate);
- Health care providers should be advised that they can refer consumers to a *HealthConnect* enquiry line in an attempt at reducing the impact of consumer questions on provider consultation times (Limited);
- *HealthConnect* was not always the priority of support groups (such as Divisions of General Practice IT services or outsourced service provider) and most trials moved towards a dedicated resource to provide support (Moderate). However, a role for Divisions of General Practice technical support staff was seen as highly beneficial in terms of local knowledge and support for GPs (Limited); and
- GPs are reluctant to participate in evaluation activities. The action research nature of the *HealthConnect* trials meant that there were frequent demands on providers to participate in workshops, complete surveys etc. GPs were often the longest serving trial participants and hence the demands of evaluation were higher for this provider group. They also tended to become disinterested if reasonably requested refinements cannot be delivered (Limited).

12.2 Technology

12.2.1 Core Systems Functionality

Each of the Field Test and the trials has had to undergo some form of software development in setting up the infrastructure of the trial (hardware, software, network, interfaces, messages, standard selection etc). The complexity of this work was underestimated in the Field Test and all of the trials and this led to delays in most cases.

The Field Test and trials involved providers in the design of *HealthConnect* through committee participation and expert design groups. Whilst this approach went some way to addressing the needs of providers, it is important that a broader based consultative process is used for the *HealthConnect* specific elements of the system is to gain greater acceptance by the wider audience of providers. This is in the context that some elements of design and presentation will remain in the domain of the clinical information system vendors.

The resulting *HealthConnect* product needs to be slick and easy to use. This will be enhanced if it is presented as an integrated part of the existing clinical information system selected by the provider. Navigation through the *HealthConnect* repository needs to be a priority consideration. The capacity to tailor the default view including filtering information should also be a consideration in the design. Other design considerations include:

- Dynamically maintained core data groups (for example, problem lists, allergies and current medicines);
- Hyperlinked event notifications that provide immediate access to the relevant event summary; and
- Encrypted content sent to provider systems reducing the need to view *HealthConnect*.

These are the lessons associated with establishing the core system of *HealthConnect*:

- The products associated with *MediConnect* and *HealthConnect* are more complex than they appear and the time to develop them is likely to be underestimated (Strong);
- Provider involvement in design aids ownership, but also quickly identifies where mistakes are made (Moderate);
- Interface development requires clinician involvement at all stages in the process of development (concept, design, testing and evaluation) (Moderate);
- *HealthConnect* needs to reflect the way in which clinicians think and practice. *HealthConnect* needs to be slick and easy to use (Strong);
- Providers will be seeking a solution that supports provider viewing without adding time to consultations. Response times have to be within specific tolerances. Community pharmacists probably need the fastest response for functions integrated into the dispensing cycle followed by GPs viewing during a consultation. All other providers need good response times (Strong);
- Providers using decision support systems are likely to be one of the most demanding groups in terms of their requirements of *HealthConnect*. They need to have the most up-to-date information from *HealthConnect* on their desktop and in a form that can integrate with their local clinical information systems (Moderate);
- *HealthConnect* will need to have the capacity to filter information. All trials have demonstrated some form of filtering in the selection of information for viewing (Strong).

12.2.2 State Network Infrastructure

Please refer to section 8.16.

12.2.3 HRS and Interface with Core Systems

Please refer to section 9.2.

12.3 Data Architecture and Coding Standards

Please refer to section 8.15.4.

12.4 HealthConnect Operational

The Field Test and trials had to establish either the *MediConnect* or *HealthConnect* repositories, enrol participants and develop the businesses process and then operate the trials for periods of up to two years in the case of the Tasmanian trial. The Field Test and trials demonstrated that there is significant operational activity required to sustain the initiatives due to the large number of stakeholders involved and the level of complexity of the overall management of the processes across both the public and private sectors.

The lessons that have arisen from operating *HealthConnect* and *MediConnect* for up to two years include:

- Sustainability requires:
 - Investment in information systems supporting clinical practice (Strong);
 - Access to *HealthConnect* facilities in all areas where clinical services are delivered, particularly in hospitals (Strong);
 - Communications infrastructure that can support interoperability with *HealthConnect* without adding to the consultation time (Strong);
 - *HealthConnect* event summary creation and viewing facilities for providers that do not have clinical information systems (Strong);
 - A well designed intuitive interface for providers (Strong);
 - Change management support that recognises that quality information will require changes in work practices, particularly with respect to the initial cleansing of data within local clinical information systems and in populating the Initial Health Profile (Strong); and
 - Comprehensive stakeholder engagement, involvement in governance and participation in all stages of the implementation are required for successful implementations (Strong).

12.4.1 Historical Data

Please refer to section 5.3.3.

12.4.2 HealthConnect event summaries being captured

Please refer to section 9.6.

12.4.3 HealthConnect Enquiries / Viewing

Please refer to section 9.7.

12.5 HealthConnect Communications

Please refer to section 5.4.2.

12.6 HealthConnect Change Management

There are two aspects to change management:

1. Managing the change in the way providers work in order to maximise the uptake, use and benefits realisation associated with *HealthConnect*; and
2. Managing the software product versioning for products used in *HealthConnect* so that at all times they remain compatible (referred to here as Technical Change Management).

Change Management for providers

The Field Test and trials undertook a range of activities to incorporate the requirements of *MediConnect* and *HealthConnect* into the systems and processes of the participating providers, and in responding to their feedback over the period of operation of the Field Test and trials.

The fundamental starting point was the inclusion of all key stakeholders in the governance structure. In the case of the Field Test this was actioned through a large group of stakeholders at the national as well as local level. In Tasmania, local stakeholder governance was achieved through representation in the Trial Management Committee and the Stakeholder Reference Group. In the Northern Territory, the Board governing the trial had key community representation and buy-in as well as representatives of the Departments and providers.

An important aspect of the Field Test and trial activities was the early adoption and continued use of Field Test and trial communications in managing consumer and provider expectations. Newsletters and information sessions were used extensively, and supplemented face-to-face project team activities. Meeting stakeholder expectations was made more difficult because of the delays associated with developing the technical solutions. The Field Test and the trials reported the importance of maintaining regular communication with providers.

In the Tasmanian trial, feedback from the evaluation was used as an element in the management of change. It provided a context to guide those involved in change process as to how they are going and an independent vehicle for expressing concerns and identifying opportunities for enhancements that might not otherwise be heard.

Divisions of General Practice were an important gateway to GPs. The Field Test and trials all effectively engaged the local Divisions of General Practice and this was essential for ongoing participation by providers. GP Practice Managers were also identified as key players capable of influencing GP participation.

In the Field Test and trials, a strong and resourceful project manager was a necessary ingredient for success. The project manager needed to have a strong knowledge of the business and the capacity to anticipate and overcome the barriers that arose on a daily basis. The ability to coordinate a large number of parallel activities was essential as well as ensuring that service providers and vendors met their contractual requirements and delivered quality products.

Establishing the brand name in each State and Territory is important because it creates legitimacy and recognition at the local level. The Northern Territory trial has paid special attention to creating the *HealthConnect* brand in the minds of the communities in the Katherine Region.

The following change management lessons learned were derived across the Field Test and trials:

- The Divisions of General Practice and other professional bodies are crucial to the ongoing participation and support of the providers (Strong);
- Keeping all providers aware of trial, evaluation and implementation developments is a significant task best delivered through a process of continuous improvement. Some of the trials had specific phases during which new functionality was added. There need to be acceptable mechanisms in place to keep all providers informed (including providing additional or refresher training if necessary) as these developments occur (Moderate);
- GP practice managers have an important change management role to play in influencing GP participation (Moderate); and
- Include clinical champions in the implementation. Participation of clinical champions in implementations provides clinical credibility (Strong). Nurses were key clinical champions in the Northern Territory and North Queensland trials (Moderate).

Technical Change Management

Project management is an essential function in the technical change management process. Many of the technical components are outside the direct control of the project manager, for example the private providers' clinical information systems. The Divisions of General Practice in many cases provide technical support services to the GP practices in their area of

operation. It will be necessary for implementations to consider whether divisional resources are seconded to the project team to ensure that Divisional resources are working to the same set of priorities as the trial project team.

The range of suppliers of component *HealthConnect* technical products and services creates a significant problem in terms of technical support. The maintenance of version control is complex, but essential.

Most software products used in the Field Test and trials had special modifications made to local clinical systems. These modifications were sometimes excluded from the subsequent software releases for core systems by software vendors causing additional difficulties. Implementations will need to ensure the contractual obligations of vendors in maintaining *HealthConnect* modifications in future releases of the software.

The lessons learned were:

- Skilful management is required to coordinate the work of the various suppliers involved in the implementation of *HealthConnect*. This work includes ensuring the interpretation of standards and specifications are consistent across suppliers and that the different parts of the solutions are delivered for end-to-end user acceptance testing in a managed way (Strong);
- Many GP practices rely on Divisions of General Practice for IT support (Strong);
- System development is far more technically complex than was first envisaged by trials and the Field Test. What seems simple to specify in requirements has proven to be more complex to deliver (Strong);
- Contracts need to specify that new releases of software contain the special modifications made for *HealthConnect* interoperability (Strong); and
- States may need a centralised software management group to coordinate the various elements of the implementation. While Governance is likely to be local (at the regional or area level depending upon States or Territories) the software needs to be consistent across States and Territories and conform to agreed national standards (Moderate).

12.7 HealthConnect Business Processes

Please refer to section 10.

12.8 Provider Preparations and Change

12.8.1 Set-up HealthConnect Infrastructure in Clinical Settings

Please refer to section 8.16.

12.8.2 Marketing and Awareness-Raising of Providers

Providers in all the Field Test and trials participated on an 'opt-in' basis. It was therefore necessary to raise the awareness of providers as to what *MediConnect* or *HealthConnect* was and to seek their participation. This activity needs to be started early and not await the arrival of the technical solution.

In the Tasmanian trial, extensive communication took place to inform providers about the concept of *HealthConnect* in the form of workshops and dinner meetings to ensure that they knew what participation would entail. For GPs it was necessary to undertake information sessions outside of practice hours, and provide appropriate refreshments.

Implementations need to develop value statements for each of the provider groups' targeted for inclusion. Each provider group can be expected to have different opinions on the value proposition and what might constitute project success.

In the Northern Territory trial there are well established channels of consultation and protocols that must be followed. These consultations include discussions with Health Boards, managers, employees and consumers. Consultation at each of these levels was a pre-requisite for the commencement of implementation activities.

Providers also participated in the expert design groups that were part of the process of development of the specific components of *HealthConnect* that they would have to use in the trial. The trial established a stakeholders' reference group to analyse issues arising during the trial and it provided input to the decisions of the Trial Management Committee. These initiatives all contributed to the change management process for the trial.

A concern expressed in a number of trials was that the decision to move to implementation was taken before many of the trials had completed their evaluations. This action seemed to detract in some providers view from the efforts they had committed to the trials and their evaluation. On the other hand, other providers welcomed the fact that they could now look forward to the implementations even though there would be a period between the end of the Field Test and trials and the implementations in their State or Territory.

The lessons learned from the Field Test and the trials include:

- Use internal newsletters and media to promote the implementations (Moderate);
- There are well established consultation protocols that need to be understood and followed in traditional Indigenous communities (Moderate);

- Stakeholders need to be briefed prior to any public announcements, particularly announcements that are likely to be controversial (Strong);
- Sell *HealthConnect* as a clinical tool (Limited);
- Flyers to GPs do not work – need person to person contact (Limited);
- Credibility matters. Health care providers expect the communications concerning *HealthConnect* to come from credible sources which will often be the professional organisations to which they belong at both national and local levels so engaging the professional bodies is key (Moderate); and
- Each stakeholder group will have a different perspective as to what comprises success from *HealthConnect*. In the trials there were a variety of stakeholders each with different expectations and measures of success of the Field Test and trials so it is important to be clear about expectations and manage stakeholder expectations appropriately (Moderate).

12.8.3 Recruitment of Providers

Please refer to section 12.8.2.

12.8.4 Developing and Training of Providers

The Field Test and *HealthConnect* trials required providers to use their clinical information systems far more intensively than they did prior to the commencement of the trials with implications for the training of providers. It was found that clinicians were better equipped to demonstrate the use of existing features of provider clinical information systems than professional IT trainers. Group clinician sessions allowed providers to gain useful insights into how other providers used their clinical information systems.

Hands on training that allows providers to explore facilities using ‘dummy’ information proved to be effective in the Field Test and the trials. It was also recognised that the development of on-line training modules and self learning facilities will be essential in providing cost effective learning support.

Too often in the trials, the training was conducted prematurely because the go-live dates were delayed. This factor meant that the training was not reinforced through use in the workplace and the low incidence of participating consumers presenting meant that providers’ lack of familiarity with *HealthConnect* became an ongoing problem for a number of the trials. The Field Test developed “at-a-glance” training guides which helped support providers that used *MediConnect* infrequently.

Hospital training should recognise that junior doctors are likely to be key users of *HealthConnect*. These doctors rotate regularly and training needs to accommodate their roster patterns. Senior providers such as specialists are more likely to encounter *HealthConnect* in their outpatient clinics and they should be encouraged to use *HealthConnect* as part of their clinic sessions.

Additionally, providers needed to understand the new *HealthConnect* consent processes, the principles of *HealthConnect* and the responsibilities of provider participation. Providers also need to be made aware of consumers high expectations for *HealthConnect*.

Most of the trials adopted a formative approach to the evaluation so that modifications were made as the trial progressed and this factor added to ongoing provider training requirements.

The lessons learned associated with the training of providers were:

- There needs to be an ongoing process of training due to the high turnover of staff within certain sectors, most notably the hospital sector and rural and remote services (Moderate);
- The challenge of maintaining *HealthConnect* skills due to the low number of participants presenting to providers (Moderate);
- Computer based hands-on training is more effective and manuals are high effort for little gain (Limited);
- Demonstrations from clinical peers can be more successful than demonstrations undertaken by IT personnel (Limited);
- The absence of refresher training in the Tasmanian trial reduced the potential of the new functionality as it was introduced (Limited);
- Training should not only include how to use *HealthConnect* but also how to interpret information within *HealthConnect* (Limited); and
- The involvement of providers in the training of other providers would be beneficial (Limited).

12.8.5 Registration of Providers

Please refer to section 6.2.1.

12.9 Consumer Preparations and Change

12.9.1 Marketing *HealthConnect*

As a new concept, *HealthConnect* needed to establish a brand image, including raising awareness amongst consumers of the purpose, potential and mechanisms of *HealthConnect*. Market testing was conducted before the launch of the trials but each trial had to determine the best approach to marketing their trial in terms of their target populations.

The work of the trial in the Northern Territory has focused on the engagement and registration of consumers in the Katherine Region (particularly the traditional Indigenous Australians in the communities there) and some very successful marketing materials have been produced including the computer animated 'Marvin' and the publication 'The HealthConnect Story'.

The Tasmanian trial only had to focus on consumers with the specific condition of diabetes. Marketing therefore targeted specific clinics those consumers attended in the hospital as well as using existing organisations such as Diabetes Australia. Mail-outs by GPs were used in both phases of the trial to initiate recruitment and these were found to be very influential on consumer participation. Consumers in the trial felt that the literature about the trial should have said more about the benefits and some said it should have been presented in larger print and should have been made available in several languages.

The Field Test required both GPs and pharmacists to register consumers. Building community awareness and acceptance was found to be necessary for point-of-care registration.

Half the non-participants that claimed awareness of MediConnect said that they had heard of it through the mainstream media. They also said that they would join MediConnect if it was to roll-out nationally. Non-participants said that privacy and security were the main reasons for not registering in the Field Test.

In the North Queensland trial, consumers were most commonly recruited when they presented for their initial appointment at the hospital. Many surgical patients of the GPs registered in the trial attended private hospitals and they were therefore outside the scope of the trial.

The lessons learned about marketing to consumers were:

- Use of public media for the launches was successful (Strong);
- Building community awareness and acceptance through a variety of channels is important (Strong);
- Local communications materials are vital in promoting the local message in a way that makes sense to people locally (Moderate);
- The need to target specific demographic groups of consumers (Strong);
- Marketing should be ongoing to maintain consumer interest (Limited);
- Health care providers are the 'frontline' agents for HealthConnect (Strong);
- Providers reported it was easier to recruit consumers if they had some pre-existing knowledge about MediConnect (Moderate);
- Endorsement by health professionals is a key influence on consumers, both positively and negatively (Strong);

- The use of the word 'Internet' draws negative reactions from consumers who prefer terms such as 'the electronic sharing of information' (Limited);
- Privacy and security concerns remain the most important concerns to be addressed (Limited); and
- The Northern Territory trial has produced promotional materials that have been well received and provide one possible model for HealthConnect implementations (Moderate).

12.9.2 Undertaking Consumer Registration

Please refer to section 5.3.

12.10 Consumer Participation

Registering consumers in a trial is only the first step. It is also necessary to ensure that the information provided at registration is not forgotten and that consumers continue to exercise their rights not only during the Field Test and trials but on an ongoing basis through HealthConnect implementations. Consumers sought ongoing awareness and feedback from the Field Test and trials.

Consumers expect to save time by not having to recount the details of consultations with other providers. They expect the time saved to be utilised in providing a higher quality and more informed consultation.

Consumers liked the idea that they could control both the content of their health record and who was able to access it.

Feedback from consumer surveys and focus groups indicates satisfaction with both the Field Test and the HealthConnect trials was high. In fact many consumers were of the opinion that the trials should not terminate, but continue on to full HealthConnect implementations.

From the evaluation conducted in the Tasmanian trial approximately 50% of all consumers had computers at home that could be used to access HealthConnect. Further, about 30% of consumers wanted direct access to HealthConnect for themselves, the person caring for them or close family member.

During the course of the Tasmanian trial about 140 (approximately half of those requesting training) of the 900 consumers were trained to access their HealthConnect record directly. Most consumers once trained were able to access their record though some found difficulty with the format of the password and others attempted to use equipment that they were advised would not work in the trial (the use of Macintosh computers was not supported).

The lessons learned were:

- Consumers expect consultations to be more professional and efficient through the use of *HealthConnect* (Limited);
- There is a need to maintain levels of consumer information awareness and feedback (Limited);
- Long delays were reported between consumer requests for training and the actual training (Moderate); and
- Consumers believe they own their own *HealthConnect* record and can control both clinical content and access to the record (Strong).

12.10.1 Convenience

Please refer to section 12.10.

12.10.2 Satisfaction

Please refer to section 12.10.

12.10.3 Confidence

Please refer to section 12.10.

12.10.4 Empowerment

Please refer to section 12.10.

13 HealthConnect Outcomes

Only the Tasmanian trial has attempted to assess the impact of HealthConnect on clinical outcomes.

The Tasmanian trial comprised consumers with either Type I or Type II diabetes mellitus. From the start of the evaluation it was determined that the seven diabetes health outcomes surrogates would be tracked and measured using the information contained within the HealthConnect record. For most parameters, 'current' means that a test has been conducted in the last twelve months. 'Controlled' means that a parameter is within a set range. The consumer's Initial Health Profile (IHP) for each phase of the trial was taken to be the baseline for the measurement of changes in health outcomes during the trial.

For example, blood pressure is one of the health outcome surrogates for diabetes. 'Current' means the consumer's latest blood pressure reading has been taken in the last twelve months and is recorded in HealthConnect. The consumer's blood pressure is considered 'controlled' if the latest blood pressure reading is less than 140 / 90. The HealthConnect record of each consumer participating in the trial was examined to find whether it contained a current reading and then whether the reading was less than 140 / 90. Graphs were drawn showing the percentage of consumers that had current readings and the percentage of consumers whose blood pressure could be considered controlled.

The lessons learned were:

- In terms of currency of test results in Phase 1 of the Tasmanian trial, HealthConnect maintained its currency relative to the IHP with improvements in blood pressure readings, eye checks recorded and weight readings that were current (Strong);
- In terms of currency of test results in Phase 2 of the Tasmanian trial, HealthConnect lost some of its currency relative to the IHP. Blood pressure and feet checks were the only two parameters that improved currency over this period of the trial (Strong);
- Health outcome surrogates generally stayed constant over the two phases of the trial with the level of control in some parameters slightly improving and some slightly decreasing (Strong); and
- The implementations of HealthConnect should aim to include a range of general health outcome measures in addition to condition specific measures (Limited).

13.1 Quality of Clinical Care – Operational

The evaluation reports have a large amount of anecdotal materials about the operational aspects of the quality of clinical care. These lessons learned included:

- Discharge summary preparation in HealthConnect is regarded as an onerous task. During rotation some summaries are left uncompleted and these may never be received by GPs (Moderate);

- Consumers accessing their records found the information to be reassuring, educational and reinforcing (Moderate);
- Consumer access also has the potential for improving compliance with medication and dietary regimes (Moderate); and
- Diabetes educators have cited cases where they have not had to chase up other provider appointments because they can see that they have taken place (Limited).

13.1.1 Care Chains

Please refer to section 6.2.1.

13.1.2 Other Issues

No lessons identified in this report.

13.2 Quality of Clinical Care – Outcomes

The lessons learned associated with quality outcomes of clinical care were:

- Access to *HealthConnect* from within preadmission clinics for elective surgery would provide additional local benefits (Limited);
- Very few conditions have a simple set of parameters that can be used as surrogates for measuring health outcomes. Diabetes management and ante natal care are a few of the conditions that do have such health outcome surrogates (Limited);
- GPs expect unnecessary duplication of pathology tests by hospitals would be reduced, however as *HealthConnect* is rarely viewed before a test is ordered it is unlikely duplication will be reduced (Limited);
- The currency of medicines is an issue because:
 - Not all prescribers in the consumer's care chain are participants (Strong);
 - Lack of guidelines as to when to send summaries has meant event summaries may not be created for minor presentations, repeat prescriptions or when a provider updates from another source (Strong);
 - Consumers can withhold or block information including those relating to medicines (Strong); and

- Some GP medicines lists are not kept up-to-date locally and hence *HealthConnect* is not updated with the current status regarding medicines prescribed (Limited).

13.3 Health Sector Management and Efficiency

Two main areas of efficiency have been identified but for reasons discussed elsewhere could not be quantified during the Field Test and the trials. These two areas are:

- Improved efficiencies in dispensing through the downloading of prescribed medicines from *MediConnect*. This is discussed in section 6.1; and
- Improved access to critical health information. Notwithstanding reported performance problems, access to *MediConnect* or *HealthConnect* was far faster than contacting a GP or the consumer's carers to obtain the required information.

14 Evaluation Lessons

For the most part, the evaluations conducted as part of the Field Test and trials were formative in nature. That is, the results of the evaluation were used to inform the Field Test or trial that was then modified on the basis of the evaluation findings. Whilst this approach mainly worked, there were a number of instances where suggested improvements identified by participants during evaluation sessions could not be brought into practice due to time or budget constraints and this caused some frustration for trial participants.

The Tasmanian trial and the *MediConnect* Field Test both had over ten evaluation reports prepared through their periods of operation. The Report of the Field Test Manager on the decision to move from Phase 1 to Phase 2 was a critical step in the acceptance of the Field Test as working in the two locations.

The North Queensland trial has had a baseline evaluation report prepared internally and two independent evaluation reports prepared on a qualitative basis. The Northern Territory trial has had three evaluation reports prepared but the first only covered the very early stages of the trial.

Going forward, evaluations need to have the capacity to be flexible and the ability to recognise the unexpected or unanticipated benefits or outcomes. The *HealthConnect* evaluation framework tended to be too prescriptive and this detracted from their ability to respond to the unexpected and meant that evaluation effort was spread too thinly over the multitude of research questions that required evaluating.

Triangulation of experiences through the sharing of evaluation findings between trials need to be encouraged. Active sharing of trial information should also be encouraged. Results of evaluations should be fed back to stakeholders early and often.

The lessons learned concerning evaluation were:

- There is a requirement for a critical mass of consumers to participate in order that providers have sufficient workload generated from participants so that the impact of *HealthConnect* can be evaluated (Strong);
- There is a requirement for an appropriate critical mass of providers for each condition being trialed to ensure that all providers in the care chain are represented and to enable the evaluation of the value of the information gained from other providers (Strong);
- The turnover of staff in a specific location, particularly in hospitals (intakes and rotations), makes it difficult to follow a particular cohort of participating providers over a long period of time (Limited);
- When new features are added into a trial, there should be sufficient time allowed for providers to become proficient in their use before an evaluation of the functionality is attempted (Moderate);

- Trials may have benefited from a staged approach to implementation as evidenced in the Field Test. This approach with associated evaluations would have ensured that all basic components were working before trialing them together (Moderate);
- The scale and complexity of the Field Test and trials limited the rigor of the evaluations. In hindsight, there were too many questions to be examined that then diluted the examination of the critical issues (Moderate);
- The evaluation of initial implementations need to focus on what is important and rigorously assess only the important issues (Strong);
- Poor provider response rates to survey instruments necessitated other methods to be used. Interviews of providers is probably the most reliable means of getting responses and gives the opportunity to clarify responses but it is more expensive than surveys and more difficult to quantify (Moderate);
- Some stakeholders felt excessive time was spent on evaluating, explaining and documenting *HealthConnect*. Often providers did not recognise that the trials were trials and that experimentation and feedback were the main reasons for the trials taking place (Moderate);
- Direct provider involvement in using *HealthConnect* is far superior to indirect use through project staff. The Tasmanian trial used project staff to create event summaries for many providers in the hospital and so many providers did not have the benefit of direct interaction with *HealthConnect* (Strong);
- Evaluation software needs to be robust to prevent uncontrolled exits from evaluation questions. The Tasmanian trial had evaluation questions embedded in the GP software and in *HealthConnect*. The additional two mouse clicks required to complete the evaluation questions proved too onerous for providers on viewing and many exited without responding (Moderate);
- High consumer responses to surveys contrast to poor consumer attendance at focus groups. This was the experience from the Tasmanian trial. The Field Test had good response to telephone interviews of consumers (Strong); and
- Greater use of evaluation could have been made in the early stages of the development of the concepts of *HealthConnect* (Limited).

15 Areas for further work

This final section of the report documents the areas of *HealthConnect* and *MediConnect* that may require additional investigation. The participants of the workshop convened to review the second draft of this Lessons Learned Report identified these areas of work. The workshop participants included representatives from the *MediConnect* Field Test and each of the *HealthConnect* trials including the Brisbane Southside trial as well as representatives from the Australian Government.

The identified gaps were:

- Private sector experience (for both private hospitals and private specialists).

Private hospitals and private specialists were often missing from the provider care chains in the trials. While it was planned in the Tasmanian trial for a private hospital to participate this did not eventuate. Only a limited number of private specialists participated in Phase 2 of the Tasmanian trial (an ophthalmologist, and a group of anaesthetists with *HealthConnect* viewing rights only).

The Field Test and the remaining trials did not include private hospitals or private specialists within their scope. Tasmanian consumers were frequently frustrated by the gaps in their *HealthConnect* records due to the unavailability of private specialist contributions;

- Aged Care sector.

Only the Field Test involved a nursing home and hostel and they only had viewing rights to *MediConnect*. None of the *HealthConnect* trials directly involved nursing homes or hostels although some of the consumers in the Tasmanian trial were residents of nursing homes;

- Emergency Access and Ambulance Services.

Although the Field Test and trials had provision for access to information in an emergency there were very few recorded instances of emergency access. Ambulance Services were not part of the Field Test or the trials;

- Point to point messaging

Many of the events that should be recorded within *HealthConnect* are associated with point to point messaging between providers. Point to point messaging using secure electronic transmissions was outside the general scope of the Field Test and trials although the North Queensland trial uses point to point messaging for referrals, surgical status notifications and discharge summaries for GPs.

- Reasons for non-participation.

Some evidence was collected in the *MediConnect* Field Test as to the reasons for the non-participation of consumers. Further work is required to understand more fully what consumers are concerned about so that any barriers to participation can be addressed;

- Large Scale Marketing

Neither the Field Test or trials had to use large scale marketing in the recruitment of consumers and providers. This is an area for further work particularly for people coming from non English speaking backgrounds. The Northern Territory trial has provided good lessons regarding the participation of traditional Indigenous Australians that might be applied to other populations;

- User Interface

Whilst the Field Test and trials have used a variety of user interfacing arrangements, no approaches demonstrated universal appeal. Additional work is required in defining user interface requirements that meets the needs of providers and consumers;

- Change Management and Training Strategies

Some lessons have been identified relating to change management. However, it is not clear what will be required in order to demonstrate sustainable change. There are ranges of situations that require consideration including the roles of change agents such as GP practice managers in implementations. There may be other parallel initiatives such as the RACP Clinical Information Program that can inform this work.

- Initial Health Profiles

Further work is required to determine what will be the content of an initial health profile, how it is created and who will undertake the task.

- Quality improvement cycles

Further work is required to explore how the quality of *HealthConnect* implementations can be improved dynamically as the implementations progress. Clearly valid evidence is essential if decisions are to be made on the basis of findings. Some of the possibilities include:

- Explicit recognition of quality issues in evaluations;
- Networking of experiences; and
- Sufficient time is allowed for the learning process.

Glossary

ADSL	Broadband network service
BA	Business Architecture version 1.9
BMMS	Better Medication Management System
CCTIS	Coordinated Care Trial Information System
CIP	Clinical Information Project
CIS	Clinical Information System
DHCS	Department of Health and Community Services (Northern Territory)
DHHS	Department of Health and Human Services (Tasmania)
DoHA	Commonwealth Department of Health and Ageing
eHealth access service	A facility to give health care providers or consumers effective means of accessing <i>HealthConnect</i> services and any frontline support needed to help them using <i>HealthConnect</i>
eHealth message bank service	A facility for conveying eHealth messages between health care providers relating to any consumer (not only consumers registered with <i>HealthConnect</i>)
EHR	Electronic Health Record
GP	General Practitioner
HeSA	Health eSignature Authority
HIC	Health Insurance Commission
HL7	Health Level 7 – The health application level in the 7 layer ISO communications model
HRS	<i>HealthConnect</i> Records System
IHP	Initial Health Profile

ISO	International Standards Organisation
NHIMAC	National Health Information Management Advisory Council
OTC	Over the counter
PKI	Public Key Infrastructure
PIN	Personal Identification Number
RHH	Royal Hobart Hospital